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LLUSD Articulator - Volume 28, Number 1

Loma Linda University School of Dentistry

Clyde Roggenkamp
Loma Linda University

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We wanted to give something back to the School of Dentistry. By donating a piece of property, we benefited from immediate tax savings while having the satisfaction of knowing our gift would make a difference in the lives of students.

— Clyde (SD '70) and Kirsty Roggenkamp
Professor at LLUSD



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LLUSD ARTICULATOR

The melding of competence and compassion
in dental education.

VOLUME 28, NUMBER I WINTER/SPRING 2017

Articulator (formerly **Dentistry**) celebrates with alumni and friends the School of Dentistry's efforts to combine compassion and competence in the education of oral healthcare professionals. LLUSD alumni represent the strength of that amalgam. The journal is published twice each year by the Loma Linda University School of Dentistry Office of Marketing.

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LLUSD Mission

Loma Linda University School of Dentistry seeks to further the healing and teaching ministry of Jesus Christ by providing an environment wherein:

Students learn to provide high quality oral healthcare based on sound scientific principles

Patients receive competent care, which is preventive in purpose, comprehensive in scope, and provided with compassion and respect

Faculty, students, and staff value the patient relationship, respect diversity, and share responsibility by working together toward academic, professional, spiritual, and personal growth

Scholarly activity and research provide a foundation for evidence-based learning and enhance whole person care

The workplace environment attracts and retains a superior and diverse faculty and staff who motivate, educate, and serve

Our communities (local, global, and professional) benefit from our service, stewardship, and commitment to life-long learning.



The 2017 alumni weekend introduced the One Loma Linda Homecoming format that featured a mingling of schools, their alumni, and so many uplifting reconnections on a familiar campus (see pages 21-29).

Editor's note:

Not that she's going anywhere, but this note is by way of noticing the untiring, ever cheerful, always creative, unfailingly professional contribution Edna Maye Loveless, PhD, professor, Dental Education Services, has made to the LLUSD alumni journal since 2001. Dr. Loveless is an unsung writer/editor who has been a scribe nearly as long as I have been alive.

Without abstracting her CV, it is worth noting that Dr. Loveless worked as a professor of English at La Sierra University from 1990 to 2001 (the last several years as chair of its English Department).

A writer, editor, and lover of The Bard, Dr. Loveless regularly attended the Shakespeare Festival in Ashland, Oregon, for many years with her late husband, and LLUSD teaching alumnus, Dr. William Loveless.

Dr. Loveless has contributed importantly to LLUSD's public print face for sixteen years, writing all of its obituaries, and frequently a feature or two of some interesting School of Dentistry faculty member, student, or alumnus.

Beyond her expertise in grammar and style and dependable editorial judgment, Dr. Loveless is an encouraging and much appreciated friend to the School and the *Articulator's* managing editor.

Sincerely,

Doug Hackleman, MA
Editor

Cover: Shot by Douglas Sandquist, DDS'97, from an Iceland ice cave in January 2016 on an iPhone 6S, this photo has appeared on billboards in more than 25 cities around the world.

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DEAN'S MESSAGE

Change, complexity, and competition

The twenty-year cold war over global warming and the nature, extent, and rate of variation in the world's climate billboards the fact that the essence of reality is unrelenting change.

The late Peter Drucker used to remind his audiences and readers that the major challenges facing businesses are constant change, growing complexity, and ever increasing competition.

The oral healthcare professions are not exempt from these dynamics. Fortunately, most of the change in dentistry over the past century has represented progress for both patients and professional practitioners. But all of this progress represents a constant challenge to those of us in dental education to make adjustments in our curriculum and our clinical mentoring that anticipates the evolving practice of dentistry.

Sometimes change is immediate and unavoidable. When at the end of March Dean Ronald Dailey took a personal leave of absence that he made permanent in June, an unexpected responsibility fell on my shoulders. It wasn't as if I did not have enough to do—with responsibilities as associate dean for Strategic Initiatives and program director of the Advanced Orthodontics program—but LLU President Richard Hart can be quite persuasive. And with the assistance of so many of you, at the beginning of April I put my shoulder to the wheel as first acting and now interim dean (beginning July 1) while a search is made for a replacement to lead the School.

Of course no matter who is dean, the significant changes that our profession is experiencing—both in patient care and as a business—require real change in how we prepare our graduates for the healthcare population and the diversifying practice options they are encountering.

Significant changes that Loma Linda University School of Dentistry is undergoing include the recent retirement of Dr. Dailey, the changing National Boards, the need for an integrated curriculum, the ongoing upgrade of Prince Hall, the need for continual improvement in the clinic model, a reset with the School's Technology Center, and stronger education in the application of business principles to the practice of dentistry.

With the recent retirement of Dr. Dailey, we experience a transition during the search for a new dean. A review of the history of Loma Linda University School of Dentistry and its previous deans—Webster Prince, Charles Smith, Judson Klooster, Charles Goodacre, and Ron Dailey—reveals that each established goals and objectives to move the School forward. Each built upon the accomplishments of his predecessor. My indeterminate time in this office will be no different. Many strategic, long-term plans under way must be completed. Dr. Dailey's recent charge to overhaul the curriculum in a more integrative direction is a response to the



Dr. Joseph Caruso

Commission on Dental Accreditation (CODA) requirements, the transition to a single national dental board by 2020, and myriad ever-changing trends in dentistry.

How are changes in oral healthcare affecting dental education? When I graduated from dental school in 1973 and from graduate orthodontic training in 1975, most graduates moved into private practice. They either purchased a practice or initiated one from scratch. That scenario has changed drastically. The subsequent four decades of our profession have witnessed a gradual trend that finds more and more of our graduates taking positions as employees of either a dental service organization (DSO) or other form of corporate dentistry rather than seeking private practice.

Whether this constant change is better or worse than what was common in the past, what matters is that dental educators understand the new forms that dentistry and specialty practices are taking and adjust their teaching and mentoring accordingly.

In the 1950s and 1960s, when I was in grade school and high school, pay phones littered the landscape. Today it is hard to find a pay phone, but many of us live on our cell phones. The traditional metal lathe once operated by a single machinist has been replaced by computer numerical control (CNC) lathes with one operator for several machines. We can think of many things that innovative products and advances in technology have rendered obsolete.

Dentistry is no different. The gold foil, once the prime example of technique and precision, has been replaced by composite dentistry. The evolution from gold to a tooth colored replacement material was required by the insatiable pursuit of aesthetic excellence. Similarly, the transition from standard orthodontic braces to clear aligners continues, though a well-trained orthodontist may be somewhat dismayed at what appears to be a move to deliver simplistic bite adjustment using clear aligners with little understanding of the biology, physiology, or biomechanical risk involved. Although only a Luddite would stand against change, our responsibility is to follow the science that most reliably benefits our patients.

“Our responsibility is to follow the science that most reliably benefits our patients.”

What benefits the patient is most critical to our core professional and educational beliefs. In accordance with our two previous deans, I recognize that as a professional school our core business is general dentistry. We are here to produce the most well prepared general dentists we can. And although the advanced specialty educator in me recognizes the difference between specialty and general dental education, it does not recognize a ceiling to the knowledge that one shares with the other.

Most of you have noticed that over the years academic dentistry also has evolved: more classroom instruction results in less clinical practice. And as the curriculum grows with the accumulation of relevant information, it is incumbent on educators to prioritize optimally—to isolate what is critical from so much that might merely be desirable.

Computers are involved necessarily in almost every phase of dental education. It takes considerable time just to familiarize pre-doctoral students with the computer applications required of them. We can comment all we want, “In my day we did such and such”; but the reality is, it’s their day, not ours. In 2017, to produce a competent dentist in four years requires that we train them with skill sets not only in dental therapeutic techniques, critical thinking, basic science knowledge, behavioral science, and practice management, etcetera, but also in how to utilize computers for the practice of computer-assisted dentistry.

The dentists of the future need not only to know the diagnosis of the patient and the etiology of their problem, they need to know how to incorporate computer-assisted technology for the optimal treatment of their patient. In today’s world we see the beginnings of that incorporation with the use of computer guided dental implant surgery, 3-D digital intra-oral impressions, and computer generated virtual wax-ups that LLUSD students are experiencing. This goes way beyond gold foils. But the precision required to produce a result that truly benefits the patient still requires an educated skill set. Computerized assistance in evaluation, diagnosis, virtual tooth preparation and treatment will increasingly provide dentists with the best practices and optimal outcomes for each patient.

I feel the obligation to promote the level of instructional excellence that our students and their patients require, to work with our Division of General Dentistry to advance the utilization of computer-aided techniques, to ensure that all students increase their experiences in all phases of dentistry, and to acquire skills consistent with Loma Linda University School of Dentistry’s tradition of excellence.

Along with these game changing advances in clinical procedures is the need to upgrade our classrooms to facilitate optimal interactivity and to continue our very strong service learning and international mission service programs, which remain extremely popular opportunities that students mention most positively in exit interviews.

A graduate of Loma Linda University School of Dentistry

must be able to provide excellent, comprehensive, competent dental patient care, and to collaborate with medical and dental specialists for the optimal care of every patient. The challenge in today’s world is to maintain the effective and efficient academic and clinical environments that achieve those goals. The core groundwork that has been established by my predecessors provides a reliable and well principled foundation upon which we can all build.

How thankful I am that in his farewell letter Dean Dailey left us with a strong message of confidence and optimism.

Working at Loma Linda University School of Dentistry is a privilege, nothing less. I have worked with the best of the best, and know that with the current pool of talented professionals, I am leaving the School of Dentistry in great hands.

Lately, when I speak with faculty and students they are positive about the changes underway and are cautiously encouraged that we are continuing to improve their education. When I visit with alumni their comments indicate how LLUSD prepared them for their professional success. Were they well prepared? In many or most ways, yes; in other ways, not so well as we would like. Today, 60 to 70 percent of graduating dental students go into some form of corporate dentistry or dental service organization. Was that a predictable change that a curriculum should have addressed? Perhaps. Issues like this and others even more complex are what we try to anticipate and to alter, accordingly, portions of our student education to keep up with changes in the “real world.”

I look forward not only to fulfilling the responsibilities of this position but also to continuing the business of mentoring—developing the best of the best not only in the area of the science and the delivery of dental care, but in understanding the business side of our profession in a changing world.

There are, however, some things that should never change—like the commitment of our administration and faculty to the missions of Loma Linda University, “to make man whole,” and its School of Dentistry, “Service is our calling”—missions that it is our privilege to advance through educational excellence that responds to the needs of the age.

Respectfully,

Joseph M. Caruso, DDS, MS
Interim Dean

PS. As a special request, if I call you to be a participant in a Dean’s advisory committee or special short-term problem solving task force, please consider that continual improvement requires continual involvement.



Upcoming Dental CE Courses:

Management of Dental Conditions

Sunday, September 10, 2017

Hot Topics in Infection Control and the California Dental Practice Act

Sunday, September 17, 2017

Medical Emergencies in the Dental Office: A Simple Approach

Sunday, October 8, 2017

Advanced Local Anesthesia Technique - A Lecture/Workshop Experience

Sunday, November 5, 2017

Esthetic and Restorative Dentistry: Materials & Techniques

Sunday, November 12, 2017

Seeing Your World in Black and White: A Review of the Maxillofacial Radiographic Lesions

Sunday, December 3, 2017

How to Eat Candy

January 21, 2018

Oral Surgery

January 28, 2018

Managing Restorative Materials: The Path to Beautiful Dentistry

February 4, 2018

Anesthesia and Pain Control

March 18, 2018

Sleep Apnea

April 8, 2018

Hot Topics in California Law and Infection Control

April 15, 2018

RDAEF Expanded Duties Program

June 3, 2018

No One Should Die with Their Teeth in a Jar

September 16, 2018

Endodontics

October 28, 2018

Hot Topics in Infection Control and California Law

November 4, 2018



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Careers in Dentistry Workshop provides informed choices

Seventy people attended LLUSD's popular annual Careers in Dentistry Workshop across four summer days, Sunday through Wednesday, July 9-12.

With a schedule that runs from 8am to 8pm, including brief lectures, mini-labs, and meals, the participants acquired a real sense of what dental and dental hygiene school is about.

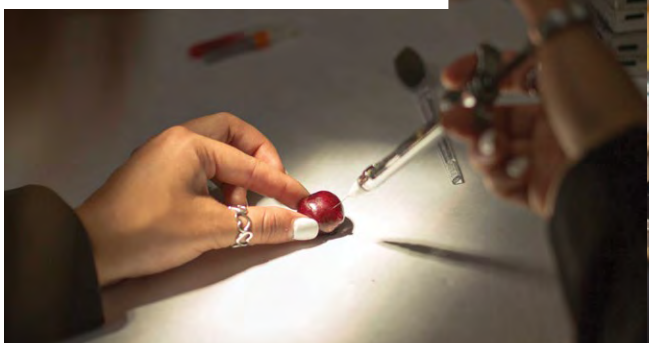
This year's group ranged from 18 to 40 years of age and arrived from all over the United States; but there were also participants from Canada and one from China.

Approximately 200 second, third, and fourth year dental students volunteered in the evenings providing each participant with a knowledgeable student mentor.

LLUSD faculty provided most of the mini-lectures and monitored the mini-lab experiences in which the guests took

impressions of their partners' mouths and poured models of them; performed infiltrations on cherries; placed composite and amalgam fillings on typodonts; and practiced wire bending after an orthodontics lecture.

Careers in Dentistry is a wonderful opportunity for anyone who needs a real sense of what a commitment to dental education would mean and to determine whether the dental profession is a good fit for them. Careers in Dentistry is also a significant recruitment tool employed by Esther Valenzuela, MBA, MA, director, Office of Admissions and Recruitment and Marlise Perry, assistant director, Office of Admissions and Recruitment.



Marlene Schultz: first LLUSD female dental student

When Marlene Schultz, DDS'65, arrived at LLUSD for an admissions interview, the School was young, having graduated only 177 dental students—and all male. (The dental school faculty was staffed entirely with men as well.) The daughter of a dentist, she had heard her father's warning, "Dentistry is too hard for women." Nevertheless she had applied for dental school after two years of pre-dental studies.

As a female she would endure her minority status for four years with equanimity. The 18-year-old Marlene Schultz was admitted, the youngest member of her class, and became the School's youngest graduate in 1965. When her lab partner asked how old she was, he sighed, "You mean we have to raise children too?" Although Dr. Schultz was the only woman in her class, by 1994, 50 percent of the graduates were women; the percentage has never fallen below 40 percent since that time.

Dr. Schultz has never forgotten the emphasis at LLUSD on treating the whole person, not just the tooth. She cites people who taught what she calls a "superior dental education," adding, "I was fortunate to have met people who were important to LLU such as the former dean, Webster Prince, DDS, and then the subsequent deans, Charlie Smith, DDS, and Judson Klooster, DDS. Dr. Klooster did gorgeous dentistry and was an outstanding teacher."

There was another professor, Lloyd Baum, DDS, "one of the main people in my life," she says. "When my father died during my freshman year at finals time, a tough time for me, Dr. Baum said, 'I'll give you any help I can. You can come back this summer to make up what you've missed.' He was known for strictness (many feared him), but his kindness is something I cannot forget."

Another impactful professor, Niels Jorgensen, DDS, shared his cutting edge anesthesiology techniques. "Of course, I don't advertise 'painless dentistry,'" Marlene comments, "but I learned from Dr. Jorgensen how to give painless injections and how to reduce patient anxiety." She comments on the invasive nature of dental care, prompting her to give attention to careful

touching, gently assuring the patient. "It is a privilege to have the trust of patients and to be able to make their lives better," she observes.

There were good times in dental classes and labs. And yes, Dr. Schultz was teased, but she never felt harassed or driven to bra burning. One day a professor announced, "I don't want you to think gender has anything to do with the grades, but Marlene got

an A on this test." Then there was the day the students were learning to administer EKG's in teams. The instructor issued what were probably his usual instructions: "Use the member of your group who has the least hair on his chest." Marlene did not volunteer to be the one tested! Marlene says, "Classmates were always kind and considerate to me."

In the 1960s the student lounge facility was attached to the men's rest room. "I probably missed some bulletin board postings because of that arrangement," she says. So many things have changed since that time.

In 1969 she established her own practice in Manhattan Beach, California. As soon as her brother (a dentist-attorney) and a cousin completed dental education, they

joined her. It is a true family affair! Dentistry practice proved to be rigorous, probably as challenging as her father had warned, which suited Marlene just fine.

In 1997, when she was awarded LLUSD alumna of the year, Dr. Schultz parried questions about marriage. "I'm too young to get married," she commented. "And much too busy." Then she met (and married) Phil Walent, who was in management at Hughes Aircraft Company. "We enjoy life to the fullest and enjoy hobbies such as photography and the theater," she says.

After 52 years in practice, Dr. Schultz is still treating patients at her Manhattan office and glad she took dentistry, pleased she studied at LLUSD, and finding in her patients a wonderful array of friends. And the patients come from as far away as the East coast—and even Africa. Marlene says, "I owe my success to the wonderful education at Loma Linda!"



Dr. Marlene Schultz and her husband Phil Walent



Dr. Schultz in 1965

Among many contributions to her dental community, Dr. Schultz has served as president of the Western Dental Society. In the California Dental Society she has chaired its Council of Membership Services, and served as trustee of the California Dental Association for six years, the first woman in that post. For the American Dental Association she has been a spokesperson on illegal dentistry and had appeared often on television to address dental issues. Over a period of many years, Marlene was active in her community, a long-time member of the Foundation Board (the fundraising part) of the Little Company of Mary Hospital and was its chair for two years. Dr. Schultz also served the Dental Board of California in several positions including as a member of the examining committee for more than 25 years.

Dr. Schultz has balanced her dental activity with a broad spectrum of interests: classical piano, judo, and karate. She has also pursued clock repair, oil painting, photography, radio-controlled airplanes, model railroads, dolls, marimba and dancing—all kinds (tap, ballet, ballroom, hula, modern). Trophies she's received for ballroom dancing attest to her skill.

Reflecting on the past 52 years of dental practice, Dr. Schultz says, "I am so very grateful for my education in dentistry at Loma Linda and for the many people whom I have met because of my association with Loma Linda. I am still thoroughly enjoying the practice of dentistry and have no plans to retire!"

The adjacent table graphs the trajectory of gender parity among LLUSD graduates.

FEMALE GRADUATES, LLU SCHOOL OF DENTISTRY

Graduation year	Total # grads	# females	% females
1957-1964	384	0	0%
1965	43	1	2%
1966	41	0	0%
1967	57	0	0%
1968	55	1	2%
1969	59	0	0%
1970	60	0	0%
1971	56	2	4%
1972	57	2	4%
1973	61	0	0%
1974	68	1	1%
1975A	68	4	6%
1975B	68	4	6%
1976	73	5	7%
1977	71	3	4%
1978	71	7	10%
1980	86	12	15%
1981	88	6	7%
1982	79	11	14%
1983	98	12	12%
1984	85	14	16%
1985	88	16	18%
1986	92	15	16%
1987	83	18	21%
1988	80	25	29%
1989	77	22	29%
1990	57	28	49%
1991	77	28	36%
1992	70	27	39%
1993	74	26	35%
1994	66	33	50%
1995	95	36	38%
1996	75	34	45%
1997	64	26	41%
1998	73	27	37%
1999	67	32	48%
2000	84	35	42%
2001	84	40	48%
2002	89	40	45%
2003	89	43	48%
2004	90	37	41%
2005	78	33	42%
2006	91	43	47%
2007	90	46	51%
2008	90	36	40%
2009	90	44	49%
2010	88	41	47%
2011	89	36	41%
2012	94	47	50%
2013	91	41	45%
2014	109	48	44%
2015	88	46	52%
2016	95	52	55%

DEVELOPMENT

Dean's Circle 2017: an interactive event



The 2017 annual LLU School of Dentistry Dean's Circle banquet was a convivial gathering of generous alumni and friends with the School's entire administrative team at the sumptuous Summit House in Fullerton.

Acting Dean Joseph Caruso, DDS'73, MS'75, associate dean, Strategic Initiatives and Faculty Practices; and chair, Department of Orthodontics and Dentofacial Orthopedics, emceed the dinner in a comfortably interactive way, as he solicited and received from Dean's Circle members' questions, candid feedback, and recommendations. An unusual degree of administrative participation found all of the School's assistant and associate deans in attendance, and Dr. Caruso involved them as well as Division of General Dentistry head John Won, DDS'05, MS'13 in the open exchange with Dean's Circle attendees.

Topics that came up for discussion

included predoctoral practice management instruction and dental practice experiences.

Skyler Liatti, DDS'14, just a few months from completing the Advanced Specialty Education Program in Orthodontics and Dentofacial Orthopedics, shared his inspiring road to the dental profession and the orthodontics specialty.

During the evening's mike around, Ravinder Singh, DDS'99, discussed some of the surprises of leaving dental school and going into private practice. He mentioned that he had been surprised by the extortion that Yelp can impose after a bad review. Also he apparently took out a lease without realizing it might have been much better financially to purchase or invest in a building. Although the annual Dean's Circle dinner is enjoyed in Fullerton, 50 miles west of Loma Linda, no one seemed anxious to leave at the event's conclusion.

To join the Dean's Circle, please contact the LLUSD philanthropy team at 909-558-4754, email: sdgiving@llu.edu or go to: tinyurl.com/jycabbj

Elaine Bersaba (D3) introduced her video: 2017 Mission to Honduras: <tinyurl.com/y8c8qstg> that she dedicated to Ernest and Gloria Chan, DDS'66, MS'68, who sponsored her trip.

In a Dean's Circle tradition, members received Dean's Circle lapel pins when they first join and then new pins are awarded in five-year increments.

The Dean's Circle appreciatively recognizes loyal alumni, friends, faculty, and staff whose generosity supports and enhances the School of Dentistry's mission with a minimum of \$1,500 to any School of Dentistry fund within a calendar year.

The predictable gifts of Dean's Circle members is used to educate new colleagues, acquire and maintain dedicated faculty, and to conquer new challenges in teaching, research, and service. Dean's Circle support is absolutely essential to the School of Dentistry's mission to continue graduating competent and compassionate oral healthcare professionals.



Elaine Bersaba (D3) introduced her compelling service learning video: 2017 Mission to Honduras.



Marcelo Toledo, DDS'06 (IDP), new Dean's Circle member, with his wife Debra



Todd Cochran, DDS'80 (4 years), speaks as Jack Burdick, MBA, CPA, assistant dean, Financial Administration, looks on.



Zhen Yew Wung, DDS'16, New Dean's Circle member with Joseph Caruso



Dean Caruso with Richard Kunihiro, DDS'86 (10 years), assistant professor, Division of General Dentistry



Kimberly LaBelle, development coordinator, Office of Philanthropy, and Juliana Powell, development officer, bracket Dean Caruso.



Dr. Skyler Liatti shared his arduous journey.



Dean Caruso with Yiming Li, DDS, PhD, MSD (15 years)



Dean Caruso with Mavern Suprono, DDS'78 (15 years)



Lee Crane, DDS'62 (11 years) and Dean Caruso



Paul Richardson, DDS'72, associate dean, Clinic Administration, with Melissa Lee, DDS'07, (five years) and John Won, DDS'05, head, Division of General Dentistry.

Norman Britton plants “last chance fund”

Recently, LLUSD senior development officer Tim Sherwin, MS, dropped by a Loma Linda retirement center to thank Norman Britton, DDS’66, for a \$1,000 contribution he had given the School of Dentistry during its 2016 Alumni Student Convention.

Dr. Britton expressed an interest in knowing if LLU’s new Gateway College in nearby San Bernardino would have dental operatories. Sherwin indicated there would be 24 chairs. As their conversation proceeded, Dr. Britton said he would like to find a way to help students who could not afford dental school tuition. It was an interest that had some basis in Dr. Britton’s struggle so many years ago to segue from farm manager to dental student.

Norman Britton was born March 31, 1924, in a Hood River, Oregon shack, the second son of a farm laborer. When his dad and mom married they were 19 and 16, and neither one had finished high school. “The family was just happy to have running water,” says Dr. Britton, who admires his father, orphaned at eight, as “probably one of the best men who ever lived. Dad was a real inspiration—a good neighbor, good father, and reliable worker.”

Norman and his three siblings went to a two-room church school because their folks would not let them go to public school, which is why he was attending Laurelwood



Dr. Britton takes a tour of his alma mater with Tim Sherwin. It had been 40 years since this class of 1966 graduate had been back to his alma mater.



Dr. Britton discusses with Tim Sherwin his desire to help qualifying dental students who badly need tuition assistance.

Academy when he was drafted by the Army in 1942.

Norman recalled how his smart older brother who enlisted in the Navy and was put in charge of X-ray machinery on a battle ship. After the war, having taught himself calculus along the way, he ended up owning and running a successful commercial refrigeration business. But he always wanted to be a physician.

Norman was very aware of his brother’s frustration. And although he didn’t mind milking cows seven days a week as he helped his dad maintain their 120-acre farm with its grain fields, its orchard, and its 30 cows, he kept going to Walla Walla College off and on for seven years, because he had dreams of being a dentist.

With some machinations by his sister in 1951, Norman began dating Nadine, a Loma Linda University nursing graduate who was at Walla Walla College earning her BS degree, and they married the next year. Norman graduated in 1954 and was hired by Laurelwood Academy to manage its farm. Five years later the school’s board sold the farm and Norman returned to Walla Walla to take pre-dental course work; and he applied to LLU School of Dentistry, while Nadine worked as a nurse at Walla Walla General Hospital and studied for a master’s degree at Walla Walla College.

With his grades—“I had the lowest GPA of anybody accepted into dental school”—and his good aptitude scores, Norman considered it a miracle when he got the call from Dean Charles Smith on the last Saturday



Dr. Britton examines one of the new electric hand pieces contributed to the LLUSD clinic by Bien Air Corporation .

evening of July 1961 asking, "Do you still want to be a dentist? Be here by mid-August," he was told.

Norman headed south to dental school that fall while Nadine remained for a quarter at Walla Walla to complete her master's degree in nursing. She wrote her thesis, worked, and took care of their two children before joining Norman in Loma Linda, he marvels. While Norman made his way through the last three years of dental education, Nadine worked as a school nurse for the Riverside Unified School District.

Walter Clark, LLU's storied dean of recruiting, and his wife put up Norman for his first semester of dental school, before Nadine and the children came to join him. Then they managed (with money borrowed from friends) to purchase a modest spec home, one of several that an Adventist minister was building, with mortgage payments of \$69 per month.

They were so poor during dental school that Norm says a date for him and Nadine meant going window-shopping. On one occasion doing just that, they encountered Dean Charles Smith, DDS, on a sidewalk. He wasn't wearing a tie, and because he was such a stickler for students wearing them around the School of Dentistry, Norman had the temerity to kid him about it. "I don't like wearing a tie any more than you do," was the answer.

As difficult an instructor as Lloyd Baum, DDS was reputed to be, Dr. Britton recalls that when one of his classmates, Paul Coe, had tumbled off his Vespa scooter breaking both wrists, Dr. Baum treated his patients until he was healed enough to resume caring for them himself.

Upon graduating from LLUSD, Dr. Britton saw a dental practice for sale in Exeter, a small California town in San Joaquin Valley

near the foothills of the Sierra Nevada Mountain Range, that had a new Adventist church and school where they would be comfortable sending their two children. From his first day in the Exeter practice the office was full of patients, many of them poor. He says that over his 25 years of practice he "did more free dentistry than cash work." So he "drove Oldsmobiles instead of Cadillacs."

After retiring in 1990, the Brittons managed to travel mostly by motorhome to 49 of the country's 50 states, missing only South Carolina. The Britton's son counsels troubled youth, and their nurse daughter has two children who have accompanied their grandparents on trips to 39 states.



Dr. Britton, accompanied by planned giving officer Ron Blaum, finds the panel of his mostly younger classmates.

In their 66th year of marriage, Norman credits Nadine "for where I am today, the luckiest man alive," and "faith in God for my very blessed life."

Wanting to find a way to help other students who lacked the means to pursue professional education, the Brittons were assisted by Ron Blaum and Tim Sherwin in formulating a Unitrust for themselves and their two children that will ultimately benefit the "last chance fund" designated for dental and nursing students who cannot afford to matriculate or face financial challenges continuing in their professional education.

WHERE ARE THEY NOW?

Brief updates on the noteworthy professional and personal activities of LLUSD alumni

Douglas Sandquist DDS'97



Dr. Douglas Sandquist

Douglas Sandquist joined his father's Las Vegas dental practice in 1998. Father (David B. Sandquist, DDS'66) and son have created a family-centered office while consistently upgrading clinical procedures.

With membership in the American Dental Association, the Nevada Dental Association, the Clark County Dental Society, and the Las Vegas Study Club, Dr. Douglas Sandquist also leads the Sandquist Study Club and is a visiting faculty at Spear Education.

While staying abreast of dental procedures and pursuing more than 50 hours yearly in continuing education, Dr. Sandquist began perfecting his skills at taking intraoral (macro) photographs for use with his patients. He also was adding locations to visit to his bucket list. His eye for promising photo ops brought unexpected prominence when he captured an image inside an Icelandic cave with his iPhone. It was chosen by Apple Inc. for use in its 2016 Colors Shot-on-iPhone worldwide campaign. (See at <http://tinyurl.com/y9445ecf>) Giant reproductions of his photo now appear at stadiums, subways, airline terminals, and on billboards, busses, hotels, bridges, etc., in Canada, China, India, Japan, Italy, Denmark, Korea, Mexico, and Turkey—and yes, the United States too. And now the photo also appears on the cover of the *Articulator*.

After hours, look for Dr. Sandquist capturing exotic landscapes digitally. View his collection at: sandquistphotography.com/

Charles Lee, DDS'75B



Dr. Charles Lee

When he joined the LLUSD faculty (2002), **Charles Lee**, began averaging three mission trips per year. Off the top, he names in sequence the dates for a dozen countries he has visited during more than 50 trips. On these trips, Dr. Lee becomes a consultant for students. In his teaching role, he responds when students ask, "How do I get the patient numb?" "Shall I take it out or can it be saved?" He recognizes that they are still at the point of determining difficult treatment choices.

Intermittently Dr. Lee returns to his Murphy Street home in Loma Linda. There in a flourishing, hedged garden, Dr. Lee relaxes. For visitors,

he names each plant: sapote, cara cara oranges, pomelo, dragon eye, guava, jujube, avocado, banana, passion fruit, kiwi, plum, pomegranate, persimmon, grapefruit cocktail, grapes, mango, mandarin, and Indian curry leaf tree. He credits his wife with propagating and hand pollinating the pitaya (dragon fruit) and cherimoya (custard apple) plants—all "fruitful." A member of the Inland Empire California Rare Fruit Growers organization, which promotes propagation, graft, and air-layer plants, Dr. Lee is currently the president of the organization.

Now reviewing his 2017 trip to Mongolia and anticipating 2018 trips to the Philippines and Golden Triangle (Thailand), he's back in his garden.

Jeryl Lynn Ziegler-Badour, BS'79 (DH)

Jeryl Lynn Ziegler-Badour followed the advice of her dentist, Duane Vitell (DDS'61): "Go to Loma Linda University and pursue dental hygiene." She liked the whole person care emphasis that has persisted in her 38 years of practice: 32 of them in the San Diego office where she sees patients.

LLUSD's Alumna of the Year (2015), Mrs. Badour also received the California Dental Hygiene Association's Outstanding Component Member Award in 2001 and 2010, and Southwestern College (National City) recognized her contribution to the establishment of its dental hygiene program with its first Sigma Phi Alpha Delta Delta Phi Chapter Honorary membership in 2013. Two dental hygiene programs subsequently established in the San Diego area have benefitted from her significant support.

San Diego County's Dental Hygienists' Society has appointed her president (three times). As a delegate to California Dental Hygiene Association (CDHA) for over 20 years, she has served at various levels of CDHA leadership—House of Delegates committee member, SADHA council member, Cora Ueland scholarship committee chair, and student research table clinic judge.

Mrs. Ziegler-Badour also actively helps her church with projects such as the Community Resource Center's Carol's House for abused women. "Giving back," she says, is what she finds truly meaningful in life.



Jeryl Lynn Ziegler-Badour

Paul Kim, DDS'06

Lt Col(s) Paul Kim has served in the US Air Force over the past decade State-side and in Italy and South Korea.

Cited as Outstanding Dental Officer of the Year in 2010, he has received Company Grade Office awards six times and coordinated a Dental Independent Duty Medical Technician Program hailed as best in the Air Force.

On a humanitarian mission, Dr. Kim was troop commander on a C-130 Hercules that lost an engine and made an emergency landing in the Marshall Islands. He spent the next twelve hours arranging overnight accommodations and commercial flights to take 40 military personnel to Guam where he negotiated similar reservations to get the team to Vietnam.

On another "cool assignment," Dr. Kim performed a root canal on Andy, a working dog with the security forces in Osan Air Force, South Korea. Trained to perform attack and drug/bomb sniffing duties, Andy couldn't perform with a broken canine tooth but now is back on his paws and working. Dr. Kim has performed similar procedures on four other military dogs. See video at: tinyurl.com/yb3gx8be

Dr. Kim currently is pursuing an endodontics residency through the Air Force at Louisiana State University.



Dr. Paul Kim



Second-year student loses eye to cancer, still sees bright future ahead

BEAU STORY

Loma Linda '19
American Student Dental
Association Chapter
Sustainability Chair

ON JULY 4, 2014, one week before my scheduled dental admission test, I was diagnosed with adenoid cystic carcinoma of the lacrimal gland. The goal I had worked toward for the last five years seemed to vanish before my eyes. After surgery to remove the malignancy, I was left with one eye. I spent time talking with a friend and thinking about my future; and while in recovery, I decided to continue pursuing becoming a dentist.

Although entering dental school was one of the happiest moments in my life, I was unaware of the magnitude of challenges that lay ahead. On top of spending time learning new studying techniques, I also had to train my brain to adapt to receiving input from only one eye. I have always thought that practice makes perfect, and although lab work initially proved quite challenging, it eventually became easier. I learned to use orientation, landmarks, and multiple

angles to compensate for my reduced depth perception, and lab work soon became one of my greatest strengths. Ironically, the greatest challenge was

not my impaired vision, but people doubting my abilities despite my performance.

Outside of lab it disappointed me when people asked if I could actually do dentistry. It is my

strong belief that people can overcome anything if they put their mind to it and work hard enough. It's up to people to see if they can push through difficulties and reach their goals, even if the journey is hard. So far, the main factor allowing me to overcome life's adversities is having self-confidence.

Losing sight, gaining perspective

Situations like mine can be a blessing and a curse. Being diagnosed with a disease, losing a loved one, or having a freak accident, forces one to look at life from a viewpoint to which many people don't have access. Although I lost some visual perspective, I have gained perspective as it pertains to relationships with people. My journey over the last few years has allowed me to meet people from many walks of life. It has taught me how to interact with those who need my support. It has shown me that although a great

education is important, it is not enough to change a patient's daily life. There's much more to dentistry than achieving the highest exam score or wearing the

most professional-looking attire.

Relationships are most important, both in life and in the profession of dentistry.

I am fortunate to be able to continue following the dream I've

had since high school graduation. I am currently in my second year of dental school, and it is a privilege. If we can all use our talents and experiences to make a positive difference in the lives of those around us, the world can become a better place for future generations. I am confident that I can use my experiences to identify head and neck cancers early on when serving my patients, and hopefully pay forward the gift of life that my optometrist gave me.

A good perspective goes beyond vision and depth perception. Perspective on goals, love and life all are essential aspects to serving our community well through dentistry. ●

This article and photo, originally published in the 2017 May issue of Contour, is reprinted with permission from the American Student Dental Association.

Left: Second-year dental student Beau Story lost his eye to cancer but won't let it stop him from pursuing a career he loves.

TRANSITIONS

Leroy Leggitt assumes chair

Leroy Leggitt, DDS'84, MS'92, MS, PhD, has been appointed LLU School of Dentistry chair, Department of Orthodontic and Dentofacial Orthopedics, effective January 3, 2017.

Born, raised, and educated in Southern California, Dr. Leggitt's several advanced degrees in higher education are from Loma Linda University.

After earning his doctor of dental surgery degree, he practiced privately for six years in the mountain town of Crestline, California (1984-1990).

Dr. Leggitt returned to take an MS in orthodontics from his alma mater, graduating in 1992. He remained at LLUSD, joining its faculty as assistant professor of orthodontics from 1993 to 1999 even as he pursued a master's degree in paleontology that the LLU School of Biological Sciences awarded him in 1996. In 1998, Dr. Leggitt was appointed program director of LLUSD's predoctoral orthodontics program.



Dr. Leroy Leggitt

From 1999 to 2007 he continued with the Department of Orthodontics as associate professor but along the way (2005) he received a PhD in biology. He also served concurrently, from 2004 to 2008, as an LLU assistant professor of geology, Department of Earth and Biological Sciences.

In 2007 and 2008, Dr. Leggitt was promoted to full professor, respectively, of both his orthodontic and geology appointments. And from 2007 to 2012 he was program director, Advanced Specialty Education Program in Orthodontics and Dentofacial Orthopedics.

Between 1992 and 2015, Dr. Leggitt's byline appeared in over 87 professional and academic publications—23 orthodontia

related and 64 in paleontology.

Between 1983 and 2014 Dr. Leggitt accumulated 39 weeks of service learning supervision of dental students in 13 different countries on five continents: Sri Lanka, Honduras, Swaziland, Ethiopia, Kenya, Galapagos, Fiji, Malawi, Brazil, Zimbabwe, Mexico, India, and Jamaica.

With his new appointment, Dr. Leggitt continues to balance two substantial careers while nurturing a serious hobby in photography.



Dr. Leggitt's photograph of the Wave, a sandstone formation located in Arizona's Coyote Buttes in the Paria Canyon-Vermilion Cliffs Wilderness near the state's northern border with Utah, was the result of a rare opportunity. By way of a lottery system, 20 people per day are permitted to visit this unusual natural formation. The star arcs were achieved through a composite of about 20 two-minute exposures.

Cynthia Scheines joins LLUSD Department of Periodontics

Cynthia Scheines, DDS, PhD, joined the Department of Periodontics as assistant professor effective March 28, 2017.

Dr. Scheines' DDS degree is from the Universidad de Buenos Aires, Argentina School of Dentistry. She subsequently earned an MS in periodontics (2001) and a PhD in periodontics (2005), both from the Universidad de Salvador.

On the faculty at the Universidad del Salvador from 2000-2006, Dr. Scheines also worked part time in a private practice. She joined the faculty of Oregon Health & Science University School of Dentistry, Department of Periodontology in 2009, and earned a certificate in periodontics there in 2015.

Dr. Scheines is a Diplomat of the American Board of Periodontology and is certified by the California Dental Board.



Dr. Cynthia Scheines

Ronald Young retires

Ronald Young, DMD, assistant professor, Division of General Dentistry, retired from Loma Linda University School of Dentistry on June 8, 2017.

Dr. Young was raised in Cherry Valley, California, and attended nearby Beaumont High School. He earned a BS degree in chemistry from the University of Southern California in 1977 and received his Doctor of Medicine in Dentistry from New Jersey's Farleigh Dickinson University School of Dentistry in 1981.

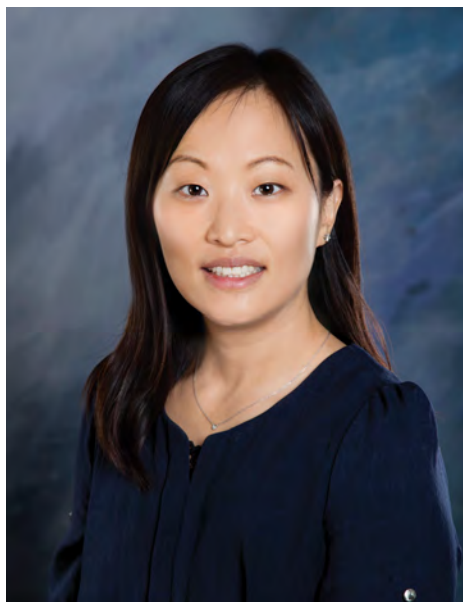
Dr. Young spent most of his career as a solo practitioner in Hawaii, before joining the School of Dentistry faculty in 2005. He has been for 12 years an esteemed member of LLUSD's clinical faculty, first with the Department of Restorative Dentistry and then with the School's Division of General Dentistry.

In awarding Dr. Young The School of Dentistry Teacher of the Year Award at the 2017 commencement service, Robert Handysides, DDS'93, associate dean for Academic Affairs, described how students and colleagues had benefitted over the years by his "welcoming smile and laugh, warm caring demeanor, clinical experience and knowledge, as well as his flamboyant Hawaiian shirts." "We have all benefited from his innovative teaching style," Dr. Handysides added, "which has made him one of the most popular instructors on campus. He will be sorely missed and impossible to replace."



Dr. Ronald Young

TRANSITIONS



Dr. Erica Chang

Erica Chang joins LLUSD Department of Pediatric Dentistry

Erica P. Chang, DDS, MS, joined the LLU School of Dentistry's Department of Pediatric Dentistry as assistant professor in October 2016.

Dr. Chang was an educator before she became a dentist. While earning her master's degree in education at the University of Pennsylvania, Philadelphia, she taught science to younger students on both coasts—first at Beverly Hills Preparatory School in California (2002) and then at West Orange High School, New Jersey, in 2004.

In 2005, Dr. Chang decided on a career change that found her graduating with her doctor of dental surgery degree from Columbia University College of Dental Medicine, New York, in 2010, and was awarded membership in Omicron Kappa Upsilon National Dental Honor Society for graduating students with high academic achievement, exemplary traits of character, and potential qualities of future professional growth.

She followed that with a certificate in Pediatric Dentistry from New York Presbyterian—Columbia University Medical Center in 2012, and became a board certified Diplomate of the American Board of Pediatric Dentistry in September 2013.

Johnathan Williams appointed Director, Dental Computing Services

Johnathan Williams joins LLUSD as director, Dental Computing Services, bringing with him 20 years experience in information technology including eight years in management.

Mr. Williams most recent assignments were as systems analyst for Sentinel Offender Services, in Irvine, CA (2000-2008), and director of its IT Services Department until 2013, when he began serving as System Analyst for Sentinel Offender Services, in Irvine, California. He transfers to LLUSD from Springboard Social Enterprises in Riverside, California, where he was Director of IT.

Beyond a variety of relevant certifications and training, Mr. Williams has expertise in HIPAA, SOX, PCI, DSS, COA, and NIST/FIPS 800-53 compliance that makes him sensitive to the security needs of LLU's diverse patient service and educational environment.



Mr. Johnathan Williams

ONE HOMECOMING #1

One Loma Linda Homecoming inaugurates campus-wide, cross-school alumni weekend



LLU School of Dentistry celebrated its 57th alumni weekend (March 2-5, 2017) under a newly inaugurated format labeled One Loma Linda Homecoming that welcomed the alumni of all eight schools simultaneously. "We are celebrating the legacy of Loma Linda University Health and the alumni who live this legacy every day," said President Richard H. Hart, MD, DrPH.

The "One Homecoming" kickoff party brought together alumni, students, and employees in a pavilion set up on the Drayson Center field that included carnival games, food vendors, and a concert by the Wedgwood Trio, the bass player for which, Jerry Hoyle, PhD, is a teaching alumnus of LLUSD's former TEAM program that was established and directed by Gilbert Dupper, DDS, 67, in the late seventies and early eighties.

One Homecoming is the format for LLU alumni weekends going forward, and it provides the opportunity for alumni who studied in Loma Linda but at the different programs to reconnect with friends they would not otherwise have the chance to see.

Images from the One Homecoming provide a sample of what some alumni missed and will remind others of the good time they enjoyed.



Top left: President Hart welcomes alumni. The Wedgwood Trio—(L-R) Bob Summerour, Don Vollmer, and Jerry Hoyle—opens the evening with its signature bluegrass music.





G #1



Kids of all ages enjoyed the kickoff event at the Drayson Center Carnival. Lower left: John Won, DDS'05, head, Division of General Dentistry, throws for a prize. And tiny tots loved the train and the slide, while the bullseye provided youngsters an opportunity to make things collapse.





Queuing up for registration in front of the Centennial Center and later visiting on the salubrious campus grounds outside the northwest corner of Prince Hall, reminds many alumni of the climate they used to enjoy.





Each of the University's schools had its own representative space, and a variety of oral healthcare vendors tabled.



Scientifically informative posters decorated the hallways, like this one from Casey Vidovich, DMD, now second year resident, Advanced General Dentistry Education Program in Dental Anesthesiology.



Brian Goodacre, DDS'13, assistant professor, lectures on Implant Restorative Space Requirements.



Jeff J. Brucia, DDS, assistant professor, Dental Practice, Arthur A. Dugoni School of Dentistry University of the Pacific, provided seven units of CE credit with his Restorative Materials Update 2017, while Stanley F. Malamed, DDS, dentist anesthesiologist, emeritus professor of Dentistry, Herman Ostrow School of Dentistry, USC, provided another eight units on Local Anesthesia—Drugs, Techniques & Complications.



ONE HOMECOMING #1

Ruel Bench feted at Mission Inn

Ruel Bench, DDS, was feted for his unparalleled service to the orthodontic profession and LLUSD's Department of Orthodontics at a Mission Inn banquet on the first evening of LLU's 2017 One Homecoming.

In the late 1950s and early 1960s, Dr. Bench collaborated with Robert M. Ricketts, DDS, and Carl Gugino, DDS, to develop the Bioprogressive philosophy that incorporates a biological approach to diagnosis and treatment options, and always views the patient as a whole—not just as a mouth with teeth that need straightening.

Dr. Bench served a three-year preceptorship under Dr. Ricketts in conjunction with UCLA and the American Association of Orthodontics from 1959 to 1962. His thesis, "The Growth

of the Cervical Vertebrae and Related to Tongue Poster," was awarded a Milo Helman Research Award.

Dr. Bench has lectured and given courses in North America, South America, Europe, Africa, Asia, and Australia.

Along with Rocky Mountain Orthodontics, Dr. Bench developed a mini edgewise orthodontic bracket system using metal injection molding in addition to preformed arch wires for Bioprogressive therapy.

Dr. Bench served as associate professor with LLUSD Department of Orthodontics from May of 2000 to June of 2016.

A seven-unit continuing education course entitled "Bioprogressive Principles and Biomechanics" was taught earlier the same day by Nelson J. Oppermann, DDS, MS, at the Centennial Complex to honor Dr. Bench's contributions to his profession.



L-R: Orthodontics residents Skyler Liatti-3rd yr, Jonathan Drew -2nd yr, Brandon Malan-3rd yr, Thanh Nguyen-2nd yr, Grace Hong Woo-3rd yr, Matthew Durschlag-3rd yr, Sue Kim-2nd yr; Dean Joseph Caruso, Dr. Ruel Bench; Orthodontic residents Theresa Baldwin-2nd yr, Shawn Abraham-2nd yr, Danielle Piano-3rd yr, Andrey Gaiduchik-2nd yr; and Kitichai Rungcharassaeng, DDS, MS, MS, professor of Orthodontics



Dr. Bench with his wife Carol



Dr. Ruel Bench with Dean Joseph Caruso, DDS, MS, MPH

Honor classes assemble for 60- 50- and 30-year reunions



*Sixty-year reunion, DDS Class of 1957, back row (L to R): Ron Zane, Robert Homer, Martin Nelson, Glenn Richey
Front row: Donald Prosser, Roger Lindner, Charles Beckett, Robert Asatani*



*Fifty-year reunion, DH Class of 1967, back row (L to R): Leslie Miller-Pfeifle, Rene Pond, Judy Abbey, Dedra Rangel
Front row: Shirley Moon, Karen Kotoske, Carol Koenig, Lena Hszieh, Linda Dixon*

ONE HOMECOMING #1



Fifty-year reunion, DDS Class of 1967, back row (L to R): Wayne Wright, Knud Pedersen, Timothy Wall, James Wise, Franklin Baughman, Williard Hodgkin, Bill Miller, Harold Lambeth, Nolan Nelson, Herman Nilsson, Lee Olsen, Jerry Tammen, Glenn Rusk
 Middle row: Ned Foss, Samuel Bleakley, Jack Bobst, Larry Bunn, Gilbert Dupper, Paul Erwin, Andrew Harsany
 Front row: Kirk Hunt, Robert Roy, Howard Kim, John Kizziar, Keith Tall, Richard Walters



Thirty-year reunion, DDS Class of 1987, back row (L to R): Michael Jones, Bill Olsen, Michael Teichman, Robert Ruiz, Ralph Miller, Steve Powell, Tim Boman, Perry Unruh, Sam Minagawa, Lawrence Low.
 Middle row: Changsu Park, Edward Mousally, Carl Seheult, Ken Li
 Front row: Stuart Rich, Carla Bryan, Debra Markoff, Najat Borg, Alan Woodson, Bill Kimball



LOMA LINDA UNIVERSITY
School of Dentistry

AAID MaxiCourse®
PRACTICAL IMPLANT EDUCATION

2018 LLU/AAID



Implant MaxiCourse®

For more than 30 years, the Advanced Education Program in Implant Dentistry through the Continuing Dental Education Division has provided part-time didactic and clinical training in implant dentistry to general practitioners and specialists.

The 2018 LLU/AAID MaxiCourse® offers 300 hours of lectures, hands-on workshop sessions, live surgical demonstrations, online lectures and clinical experiences placing dental implants on participants' patients. The LLU/AAID MaxiCourse® brings the experience of renowned instructors and clinicians from Loma Linda University and around the world.

The 10-month sessions (two days per month) also help prepare the participant to take the written portion of the AAID Associate Fellow Membership Examination. The didactic portion of the course includes information for beginners, intermediate and advanced clinicians in implant dentistry wishing to expand their knowledge in this field.

The program is designed to take the participants through a systematic learning approach of implant dentistry.

Starting with basic concepts, diagnosis, treatment planning, dental implant surgery and implant prosthodontics, the attendees have the opportunity to develop sequential treatment plans on their own patients and participate in performing surgeries with the assistance of experienced faculty and residents of the Advanced Education Program in Implant Dentistry.

The attendees also experience hands-on workshops where procedures such as cone-beam imaging analysis, simulated patient-based dental implant surgery on life-like mannequins and guided-bone regeneration procedures on cadavers and pig jaws complete the understanding of basic and advanced dental surgical procedures.

Dates: March 8 - December 7, 2018

Tuition: \$15,000

Over 500 participants have completed the LLU School of Dentistry and AAID MaxiCourse program.

REGISTRATION INFORMATION

To register for LLU/AAID MaxiCourse contact Loma Linda University School of Dentistry Continuing Dental Education office at (909) 651-5673 or visit us online at dentistry.llu.edu

Dental Caries Research Observations from Ralph Steinman and John Leonora: A Historical Perspective

Clyde Roggenkamp, DDS, MSD, MPH

Ralph Steinman, DDS (1910-2007), was one of the three founding faculty members of Loma Linda University School of Dentistry (LLUSD) in the early 1950s. A strong academic foundation gained from his education at Emory University School of Dentistry, and significant clinical experience from several years of private practice, led him to question whether W. D. Miller's commonly held bacterial theory¹ was sufficient to explain the problem of dental caries. He was influenced by the writings of Ellen White on health and wholeness.^{2,3} Also in his library was a book by Weston Price, *Nutrition and Physical Degeneration*, a comparison of primitive and modern diets and their effects⁴ that had become popular in promoting basic dietary lifestyles.

The problem of dental caries, in Dr. Steinman's view, could not be adequately explained by the presence of bacteria on teeth; there were missing pieces that needed to be explored. His position as the primary dental researcher at the new dental school at Loma Linda University permitted him to pursue this interest for several decades.

Dr. Steinman's opportunity to collaborate with endocrinologist Dr. John Leonora, PhD (1928-2006), at Loma Linda University School of Medicine led to a productive team effort for many years. Dr. Leonora contributed expertise in hormone physiology, and their combined research efforts accelerated in the 1960s. Their partnership facilitated a search for potential systemic, hormonal roles in dental caries disease beyond the confines of the oral cavity.

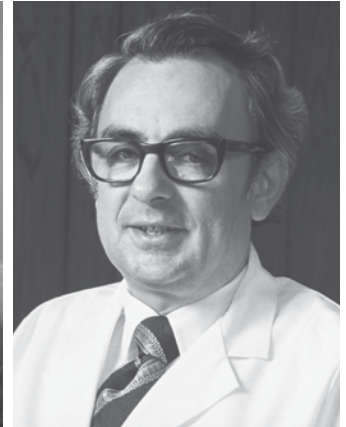
Given the current understanding of dental disease, it is interesting to revisit the hypotheses that Drs. Steinman and Leonora, along with other investigators, proposed.

The complex nature of their collaboration joined dentistry not only with medicine but also with many of the basic sciences including biochemistry, histology, microbiology, nutrition, pharmacology, physiology, and public health, as well as the concept of wholeness that has been an important part of Seventh-day Adventist lifestyle. Their research resulted in nearly 100 publications; but because of the less than orthodox view of dental disease, their literature did not receive widespread acceptance in the scientific community.

This article represents a historical perspective on the scientific research of dental caries by Steinman and Leonora.



Dr. Ralph Steinman



Dr. John Leonora

A review of their publications illustrates the complex nature of basic science research and the importance of accumulative and collective efforts to understand the mechanisms of dental caries and the challenge of designing effective measures for combating dental disease.

Elusive, key hormone-diet-caries connection

Not all of the various mechanisms of dental caries susceptibility and resistance have yet been discovered or totally understood. It is a nearly universally held belief that acid of bacterial origin is the prime cause of caries. But Steinman began noticing in the mid-1950s that the concentration of acid present on the surfaces of teeth was not the sole determinant of whether caries ultimately would develop.^{5,6,7,8,9} Teeth appeared to exhibit a native capacity for resisting the penetration of acids and other harmful solutes. This capacity existed except under conditions of high sucrose ingestion, regardless of whether the sugar contacted the teeth or not.¹⁰ The search for a deeper answer to caries resistance vs. susceptibility led him and his co-workers to suspect a hormonal connection.¹¹ In 1980 Tièche, Leonora, and Steinman¹² isolated and identified a parotid hormone (PH), purified from porcine parotid glands. Leonora, Tièche, and Celestin¹³ subsequently found that experimental pigs exhibited significantly higher concentrations of a parotid hormone releasing factor (PHRF) within minutes of chewing and swallowing food. PHRF appeared to signal the parotid gland to secrete PH.¹⁴

PH was shown to activate pulpal odontoblastic cells to induce extracellular dentinal fluid through the profuse

The author wishes to express gratitude to his wife, Kirsten, a career schoolteacher, for providing the continuing education questions for this article.

microscopic radiating system of dentinal tubules that extend from the centrally-located pulp to the outer enamel surrounding the tooth. Pressure from the odontoblastic cells caused this fluid to press outward through the enamel's tighter interprismatic pore structure and ultimately onto the tooth's outer surface. Visible evidence for this came from various systemically introduced dye tracers.^{15,16,17,18}

This hypothalamic-parotid-endocrine-axis mediated outward flow of dentinal fluid was indicated as a normal process of vital teeth. The apparent protective mechanism of this theoretical model was proposed for caries resistance by continually providing a counterflow to the entrance of external acids and other potentially harmful solutes (see Fig. 1).^{15,16,17,18}

This natural nutritive-maintenance process, however, was shown to be impeded or completely reversed by the ingestion of excess sugar. Increased sugar consumption was correlated with decreased dentinal fluid transport (DFT) inferred from intradentinal dye penetration (IDDP) studies.^{9,10,14,19} Sugar demonstrated a direct, antagonistic effect on the hypothalamus gland in animal experiments that exhibited inhibition or reversal of IDDP, which in turn was associated with an increased caries rate.^{15,17}

It was assumed that a similar hypothalamus-parotid endocrine axis (HPEA) mechanism involving IDDP or DFT^{15,16} existed in human teeth as well (Fig. 1). This assumption was proposed to explain the hidden detrimental role of excess dietary sugar. In adult dentition, the unseen metabolic gatekeeper was considered to be the key to caries-resistance until a disturbance occurred.⁶ Beyond providing nutrients for acid-producing bacteria as is commonly believed, excess sucrose may thus profoundly disturb this natural (HPEA) defense mechanism. Steinman showed that when sucrose constituted at least 60% of the diet, it caused a reduction of up to 50% of the DFT rate compared with a control group.⁹ This finding by Steinman, Leonora, and Tieche at Loma Linda University remains unique in peer-reviewed literature.

The Figure 1 schematic of a human molar illustrates that tooth morphology is designed to maintain fluid flow through its structure. Dentin is composed of microscopic tubules (canaliculi) that radiate from the dentin-pulp interface to the dentin-

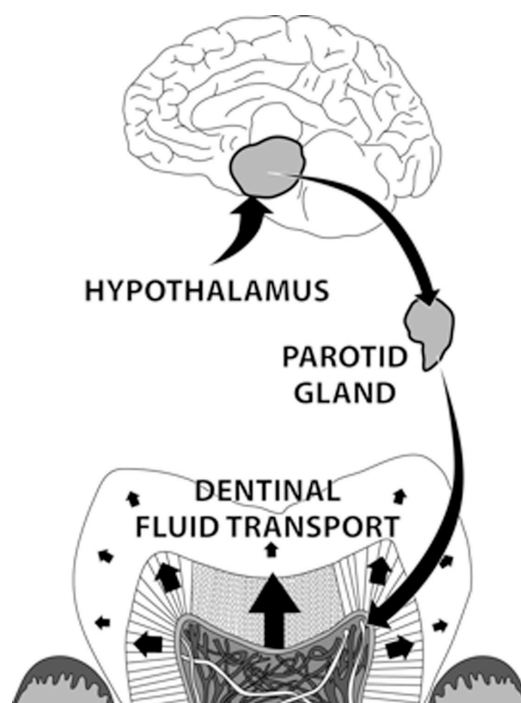


Figure 1. Diagram representing the human Hypothalamus-Parotid gland Endocrine Axis (HPEA)²⁰

enamel interface. At the base of the dentin is a layer of odontoblasts responsible for the secretion of dentin matrix and, because dentin is a living tissue, the maintenance of dentin vitality. Dentin, as a living tissue, requires nutrition; but, as the diagram illustrates, the blood supply terminates in the pulp chamber. To compensate for the lack of vascularity, teeth possess a dentinal-fluid-flow transport (DFT) mechanism that perfuses the dentin with essential nutrients derived from the blood. Capillaries in the pulp are fenestrated (have windows), allowing nutrients to perfuse into the pulp chamber in a lymph-like fluid. Steinman and Leonora suspected that odontoblasts play an active role in the transport of this fluid from the pulp chamber out through the dentinal tubules and enamel fibrils.

The arrow from the hypothalamus to the parotid gland indicates the parotid hormone releasing factor (PHRF). This messenger activates the parotid gland to express parotid hormone (PH) into the circulating blood, where it is believed to be picked up by the odontoblasts and effect greater flow of dentinal fluid outward through the channels and microporosities of the tooth. The arrow from the parotid gland to the pulp of the tooth is intended to show this occurring indirectly via the blood stream and not directly through the outer structure of the tooth as it may appear from this diagram. An ultimate cause of dental decay strongly suggested by Drs. Steinman and Leonora was that high blood sugar levels dramatically interfere with this process to the extent that an actual reversal of dentinal fluid occurs. Instead of the normal outward flow preventing the ingress of detrimental products including acid, these substances are drawn into the enamel porosities, and dentinal tubules and dental caries can result. Therefore, sugar ordinarily considered as a direct cause of decay by providing nutrients for harmful bacteria in dental plaque, can also be the enemy within by interfering with normal internal physiological resistance mechanisms of teeth.

As indicated by Dr. Leonora in his foreword to the book, *Dentinal Fluid Transport*,²⁰ the uptake of nutrients appeared to be parotid-hormone dependent.^{11,21} The hormone may alter the permeability of the pulpal capillary walls, enabling the membranes to transfer nutrient-containing fluid into the surrounding tissue and hard-structure spaces. Intrinsic osmotic pressure gradients might serve as mobilizing influences. The physiological movement of dentinal fluid would be to the periphery. Fluid droplets potentially



Drs. Steinman and Leonora share a collegial moment in the lab.

occurred on the surface of the enamel, especially where micro-cracks or craze lines occurred. Because the hydrostatic pressure within the tooth would be greater than the external oral pressure, diffusion of harmful outside bacterial products into the tooth structure would be prevented and thus teeth would remain caries-free. It is after the DFT mechanism had been compromised to the point of reversed flow direction, from the outside inward, that cariogenesis could readily occur.

Dr. Steinman summarized his findings in a paper published in 1987:

This poorly appreciated complexity of caries susceptibility can help explain why decay does not correlate well with [merely] the acidogenic potential of foods or with the solubility of enamel in acid. Sucrose and other cariogenic foods cause decay not only because of the unfavorable external environment they produce in the mouth. Such foods may also disturb the physiological resistance of teeth to decay, including the normal outward flow of fluid through the teeth.²¹

Histochemical effects of caries on tooth structures

Before discovering a possible hormonal basis for the connection to dental caries, Steinman tried to learn as much as possible about the physiology and histochemistry of the caries process in order to identify some dietary or other means of controlling it. At the time of his studies the average diet consumed by Americans was determined to be 18-20% sucrose (table sugar) and was recognized as a significant contributor to the high US caries rate.²²

Using a variety of techniques, Steinman learned that teeth on a cariogenic high sucrose diet (HSD) first underwent

a metabolic change in the dentin before actual breakdown occurred.²³ He reported that this was not a one-way mechanism, however, because he found that the caries process could be reversed by eliminating the sugar consumption of the experimental subject if the caries had not progressed much beyond the dentinoenamel junction (DEJ).^{8,10,19,23,24}

Studies on the effect of sugar on developing teeth

The findings and recommendations of Steinman on the one hand are historic but on the other hand provide a unique example of seeking answers to questions that require additional research. His basic assumption was that sucrose had cariogenic effects,

particularly on developing teeth. His research pursued the questions of how and why.

In one of his earlier studies Steinman found that increased ingestion of sugar was associated with reduced phosphorus levels in the blood, thought to be due to an accompanying greater phosphorus demand from increased metabolic glucose phosphorylation.^{6,25} As a consequence, pre-weaned rats showed a 10% decrease in total phosphate content in their developing molar buds, which subsequently correlated with reduced post-eruptive dental caries resistance.²⁵

For infants, not all sugars were found equally cariogenic. In fact, lactose was consistently found to be the least caries-producing. This is partly due to its brief time in the mouth compared to extended periods of bottle sucking, especially if there is a slight dribble from the artificial nipple into the mouth as the child sleeps. Unfortunately, several commercial infant milk formulas at that time added significant amounts of sucrose to their formulas. Steinman insightfully recommended avoidance of these brands in favor of those with less sucrose.²⁵

Value of vitamins and minerals in dental health

Availability of nutrients and their proper assimilation can also control dental caries susceptibility. Vitamins A, C, D, as well as minerals calcium and phosphorus, are essential for the formation and calcification of enamel.²⁴ Vitamin C has been shown essential to the calcification of the teeth.²⁶ Phosphate and magnesium are an integral part of dental structures and are associated with various metabolic processes. Mg is an activator of many glycolytic system enzymes upon which the health, integrity and function of dental structures depend.²⁷ When the earliest evidence of caries occurs at the DEJ, the addition of

fluoride to the dietary regimen enhanced remineralization of the affected areas.²³ An in vitro study conducted by Steinman in 1965 determined that fluoride-treated enamel underwent significantly reduced calcium release under experimental demineralizing conditions.²⁸

Trace elements needed for enzymes, hormones

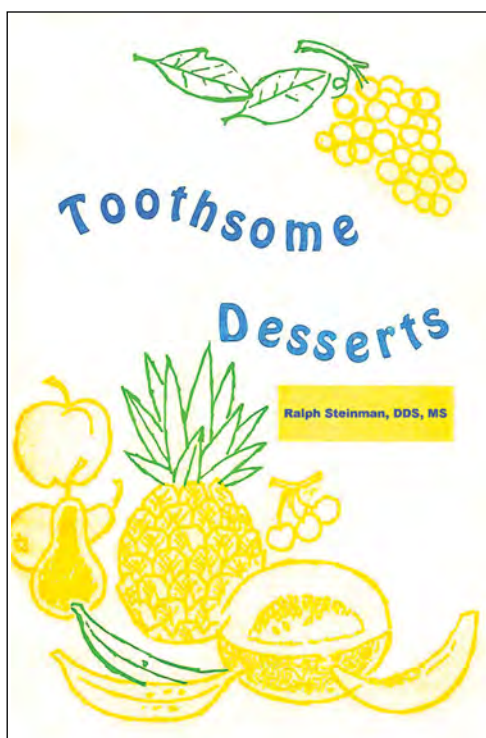
Trace elements added to a cariogenic diet not already containing these elements produced a definite cariostatic effect. Chromium deficiency may affect glucose homeostasis, thereby impairing glucose tolerance. Zinc may be involved with the normal production and action of insulin, and a zinc deficiency would impair blood glucose homeostasis.²⁹ In order to make a more wholesome laboratory animal-feed formula beyond the standard items already contained, Steinman added mineral supplements of phosphorus, iodine, fluoride, pyridoxine, zinc, molybdenum, and chromium.³⁰

It is well to note that altering the supply of carbohydrate, fat, protein, vitamins A and B, trace elements, and minerals has been found to influence the incidence of post-eruptive dental caries.⁸ In general, Steinman found that the poorer a diet was in vitamins, minerals, and trace elements, the more frequently that diet seemed to be repeated. Caries potential would be multiplied by between-meal snacking. In this connection also it was shown that commercial removal of nutrients from food was associated with an increased rate of dental caries.³⁰

Importance of electrolytes

Sodium and chloride are the major electrolytes of the extracellular fluid, controlling osmotic pressure and water balance. In a group of laboratory rats given only 0.9% saline as their sole source of fluid, the caries score was 10.44 compared to 6.72 for the control group on regular water. Steinman and Leonora employed the diuretic effects of Diuril and Percorten and concluded that electrolyte imbalance could be a systemic factor in caries susceptibility ($p=0.001$).³¹ Higher Na and Cl concentrations within the pulp and the tooth could potentially affect caries resistance in more than one way. By altering osmosis and water transport, these electrolytes could influence the nutritive state of the developing tooth, affecting final maturation and resistance to decay.

Any change in osmotic balance could also alter its relationship to the external environment. Under certain circumstances,



normal osmotic pressure may tend to repel noxious bacterial agents, whereas under conditions induced by abnormal osmotic pressure it could actually encourage ingress of harmful solutes into the tooth.³²

In addition to Na and Cl, deficiencies in certain other metabolites or associated factors—such as phosphate, pyridoxine, pantothenic acid, or protein—can also conceivably alter the cells' normal selective permeability.³³

Thus, the electrolyte balance of the tooth may play a vital role in susceptibility or resistance to the disease. The physiological state of hydration also may be of greater significance to dental health than commonly recognized.³²

Anticariogenic formula, enhanced by eggshell meal and trace elements

The metabolic pathway of the hypothalamic-parotid endocrine axis Steinman and Leonora proposed was associated with the ornithine cycle. They tested certain compounds related to this cycle and discovered a marked enhancement of DFT in teeth.² After an elaborate trial with laboratory animals, the most profoundly effective agent of those tested was carbamyl phosphate. Because of its highly significant anticariogenic effects, well beyond that seen with fluoride treatments alone, carbamyl phosphate was potentially considered as a therapeutic dietary additive for caries-prone human patients. An effective adult human dose was extrapolated to 150 mg daily without adverse effects. Eggshell meal was found to contain a substance that weakly stimulates fluid movement as well. Its potentiating effect allowed the possibility of reducing the effective anticariogenic dose levels of carbamyl phosphate. The addition of the trace minerals zinc, chromium, and molybdenum even further enhanced the caries resistance effect. The total combination of all these ingredients in the diet of experimental rats resulted in caries-free teeth.⁹

Dental benefits from whole grain foods

Primitive peoples subsisting upon natural foods usually remain quite caries-free, whereas similar racial stocks eating more "civilized" foods have significant decay. Perhaps this is a reflection of over-refinement of our commercially available foods. It may be well for civilized countries to give greater importance to whole grain cereals daily.⁴ To show this comparison, Steinman fed one group of experimental rats a menu of corn flakes, unenriched white flour, potatoes, spaghetti, ice cream, cherry pie, and soft drink. The same diet was also fed to another group

with the exception of replacing unenriched white flour with the whole wheat type. The caries scores (Chi square, $p = 0.01$) for the two groups after five weeks were 11.14 for the unenriched compared to 4.14 for the whole grain group, which indicated a marked increase in caries potential with refined grain products.³⁴

In another study, a questionnaire was distributed regarding the eating habits of 278 children ages 4-20. Children with greater prevalence of dental decay were found to consume white bread and packaged cold cereals more than those having no decay. Refined cereals were considered to be a factor in this caries difference. So much major attention had been given to sugar content that perhaps too little mention was made regarding refined cereal products consumed.³⁵ Due to research insights from this and similar reports by other investigators regarding the empty calories of white flour and especially cold cereals in the mid-1900s, food producers began fortifying these products with added vitamins and minerals.

Dr. Steinman and his wife each had numerous dental restorations in their own teeth, but their children at ages 22, 26, and 28 had only one surface with incipient caries. His daughter now recalls that something was done by the dentist but that there was no restoration noted afterwards. Their children's dietary regimen had consistently been (1) no between-meals snacks, (2) reduced sucrose consumption to only 12-15 lbs/person/year, and (3) only whole grain cereals and breads. Essentially their meals were devoid of refined foods, which was considered by their parents to provide them with an important caries-preventive advantage.³⁶

General dietary advice

When the increased sugar content of synthetic diets was replaced by a polysaccharide such as starch, there was an accompanying marked decrease in caries. It appeared that rapidly absorbed sugar was what interfered with the HPEA system and prevented its ability to protect teeth from caries. From this it would seem advisable to include more slowly absorbed sugars in the diet. Since carbohydrates are needed as a source of energy, the bulk of carbohydrates should be obtained from starch, which is found in abundance in whole grains and vegetables.¹³ Steinman

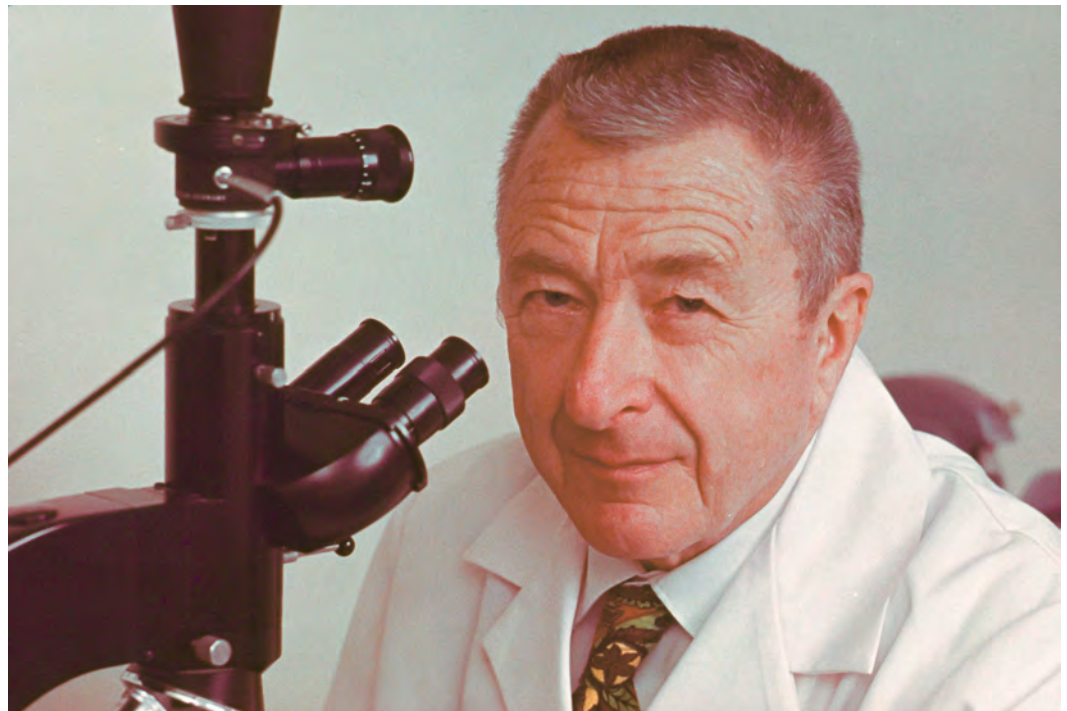
consistently encouraged less sucrose in the diet, more whole grain products and more fresh fruits and vegetables.³⁷

In its 1977 publication, "Dietary Goals for the United States," the Senate Select Committee on Nutrition and Human Needs recommended a 40% reduction of added sucrose in the diet (compared to Steinman's suggestion of 80%), an increased use of fruit and vegetables, and the replacement of refined cereal products with corresponding whole grain products. Steinman and Leonora believed that the basis of dental resistance to caries is to allow the teeth full function of their normal defense mechanisms.³⁷

It has been recognized that high sugar foods provide the nutrients for plaque organisms to produce acid, causing demineralization of enamel and dentin. Steinman proposed that this would tend to occur at times of lower hormonally-mediated defense.³⁸ Caries reduction is favored by eliminating between-meal snacks and replacing rich desserts with fruits and vegetables.²⁵ Sugary snacks between meals would inhibit the release of parotid hormone that normally stimulates a defense mechanism in the teeth, and interfere with what Steinman and Leonora considered to be nature's way of defending the teeth against caries.

The most prevalent characteristics seen among caries-prone patients were as follows.

1. Eating foods with low nutritive value; such as frequent sugary between-meal snacks, which are almost totally deprived of vitamins, minerals, and trace elements.



Dr. Steinman with a researcher's friend.

2. Diluting the nutritive value of food by the addition of sucrose in large amounts, or draining cooking water from vegetables.
3. Consuming white flour which contained less pantothenic acid, pyridoxine, zinc, molybdenum, chromium, fluoride and phosphate than natural whole wheat.
4. Suffering from an endocrine imbalance.³⁰

What about sugar at meal time? Steinman's work indicated that there was generally a certain amount of stimulating effect on the release of the parotid hormone at meal times. This would be decreased by the amount of sugar, increased by the quantity of micronutrients in the meal, and ultimately realized by variability of the host's response.³⁸

What about the bottle-fed caries syndrome? Since milk and milk products are usually associated with less caries, there was suggestion of a depressed release of parotid hormone influenced by the amount of sugar in the formula and by less hormone being released during sleep.³⁸

Recipe suggestions for avoiding excess sugar in desserts

Dr. Steinman was consistent in his persuasion that sugar, particularly sucrose or table sugar, was a predominant, detrimental element in the everyday diets of most developed countries and needed to be reduced substantially. A small book of sugar-free recipes originally developed for his immediate family eventually saw publication. *Toothsome Desserts*²⁰ contained nearly 40 naturally sweet-tasting selections without added sugar under such categories as Fruit Desserts, Chilled Desserts, Cookies, Cakes, and Tarts & Pies. In his preface to the book Dr. Steinman wrote, "The desserts our family eats include fruits and melons and are of the simple, low-sugar variety—not the type that is high in sugar and low in vitamins and minerals. Whereas the usual dessert has 5 to 16 teaspoonfuls of added sugar per serving, our desserts do not have over 2 teaspoonfuls."²⁰

Optimal harmony of all body systems necessary for total health

It has been recognized that the tooth is not an inert appendage in an at-risk environment, but a vital organ capable of resistance when functioning normally. Disease is the result of disharmony; when disharmony prevails in teeth, dental caries is more likely.²³ The metabolic shield⁶ of the tooth is protective only when there is a functional balance between each of its various supporting systems.⁸ Since all parts of the body are physiologically interconnected, whatever affects the body's health can potentially, to a greater or lesser degree, affect the health of the teeth.³⁹

The caries problem has proven to be as complex as life itself. Perhaps the best overall solution, given each individual's

hereditary make-up, is an improved lifestyle that includes optimal nutrition, stress reduction, fresh air, regular exercise, and the appropriate intake of water.⁴⁰

Summary

This review of the publications on diet and dental caries by Dr. Steinman and coworkers covers a period of 35 years (1957-1992). Several of these research findings have been confirmed, such as the role of sugar and diet in the development and prevention of dental caries, while others, such as observation of the effects of parotid hormone (PH) and parotid hormone releasing factor (PHRF) in the caries process of animals, still await replication in humans. In addition to its historical value, the work of Dr. Steinman and colleagues should inspire new efforts to continue the interdisciplinary research they began.

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Steinman/Leonora caries research—the quiz

Circle the letters of the correct answers.

- Steinman and Lenora theorized that excessive consumption of sugar affects
 - the production of acid that is detrimental to tooth enamel.
 - the hypothalamus-parotid-endocrine axis that protects the teeth.
 - the individual's desire for more sugar.
 - none of the above
- Parotid hormone was shown to enable
 - pulpal odontoblastic cells to transfer nutrient-containing fluid..
 - the production of peptic acids needed for digestion.
 - the production of stronger hair and nails.
 - all of the above.
- According to Steinman and Leonora, the fact that the hydrostatic pressure within the tooth is greater than the external oral pressure
 - results in toothaches.
 - stimulates the parotid gland to produce a beneficial hormone.
 - prevents harmful bacterial products from permeating the tooth structure which helps maintain the teeth caries-free.
 - increases the appetite for sugar consumption.
- Sucrose apparently acts primarily and directly on the ____ to interfere with the caries prevention loop.
 - teeth
 - parotid gland
 - brain
 - hypothalamus
- Why does whatever affects health of the body also affect the health of the teeth?
 - All parts of the body are physiologically interconnected.
 - Diet affects the whole body.
 - Exercise affects the whole body.
 - All of the above.
- What commercial practices in food production increased the level of dental caries in the general population?
 - the pasteurization of milk
 - the refinement of sugars
 - the refinement of flour
 - the addition of salt and fats
- What causes caries in primary teeth?
 - allowing children to fall asleep with a bottle of formula or juice in their mouths
 - consumption of sugary, between meal snacks
 - eating refined foods from which vitamins and minerals have been removed.
 - all of the above
- Dentinal fluid produced from blood is distributed through the tooth by
 - capillaries
 - dental matrix
 - canaliculi and fibrils
 - none of the above
- The consumption of whole grain breads and grains contributed to
 - an increase in dental caries.
 - a decrease in dental caries.
 - no effect on the incidence of dental caries.
 - none of the above.
- What addition to rats' diets decreased the likelihood of their developing caries?
 - whole wheat
 - milk
 - carrots
 - spinach

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SCIENCE

LLU Homecoming 2017 scientific poster presentations

LLU School of Dentistry dental students from the class of 2018 and students from the Department of Dental Hygiene class of 2017 made their student research poster presentations during the first LLU One Homecoming.

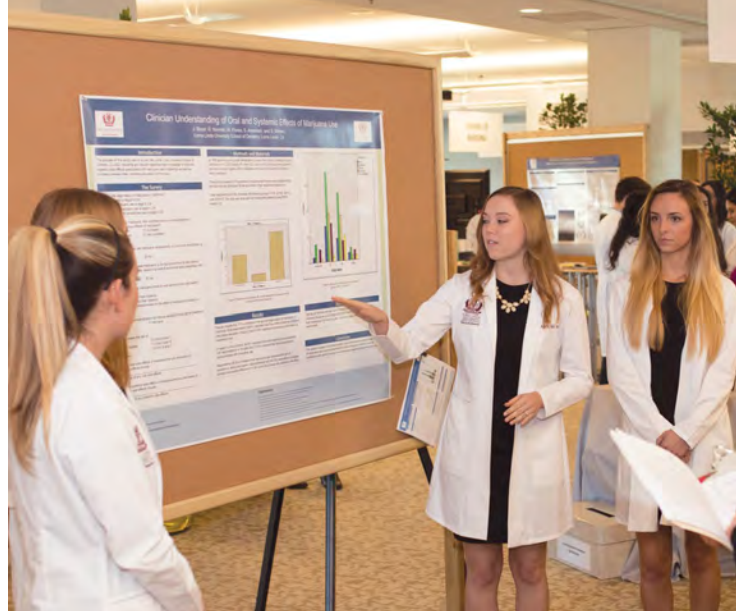
The annual presentation of student research was held in the Centennial Complex' third floor where the posters

could provoke interest from alumni and students, and undergo the scrutiny of faculty judges who determined this years winners in clinical, community, and scientific categories.

The winning posters are featured below and in succeeding pages.



Student research judges (L-R): Ronald Forde, DDS'83, assistant professor; Shelly Withers, BS'00 (DH), MS, associate professor; and Jeong "Sue" Kim, DDS'05 (IDP), PhD, MSD, assistant professor



Dental hygiene student researchers (L-R) Mackinsie Flores, Rachel Norman (bidden), Jess Bayer, and Signe Anderson explain their research on the oral and systemic effects of marijuana use.



Dentistry, Clinical Category, 1st place

Kathleen Aguilar, Kyle Leis, Jessica Wyrostok

"A retrospective study analyzing propofol maintenance dose requirements for autistic children receiving dental treatment under general anesthesia"

Mentors: Samah Omar, DDS; Udochukwu Oyoyo, MPH; Neal Johnson, PhD, DDS



Dentistry, Clinical Category, 2nd place

Ross Emerick, Ashlee Sumilat, Elisabeth Mauro, Jeff Anderson

"Esthetic outcomes following the use of PNAM prior to cleft lip/palate surgery: a multivariate analysis of cross-sectional data"

Mentor: Jung Wei Chen, DDS, MS, MS, PhD

SCIENCE

2017 scientific poster presentations (cont.)

**Dentistry, Clinical Category, 3rd place***Anahita Farahani***"Reproducibility of linear alveolar ridge measurements in two DICOM CBCT viewing software programs"***Mentor: Kenneth Abramovitch, DDS, MS***Dentistry, Community Category, 1st place***Christopher Chan, Emerson Lowe***"Implants: A survey on the planning, placement, and restoration process"***Mentors: So Ran Kwon, DDS, MS, PhD, MS;
Montry Suprono, DDS, MSD***Dentistry, Community Category, 2nd place***Trina Chung, Abhishek Batra, Kayla Perez-Ortiz***"Perspectives of dental students and faculty on the value of performing a research project as part of the curriculum"***Mentors: So Ran Kwon, DDS, MS, PhD, MS; Udochukwu Oyoyo, MPH***Dentistry, Scientific Category, 1st place***Jamie Kim, Sooyeon (Grace) Chung, Lidya (Lynda) Lee***"An In-vitro investigation of dimensional stability of an extended-pour irreversible hydrocolloid impression material over time"***Mentors: Montry Suprono, DDS, MSD; Clyde Roggenkamp, DDS, MSD, MPH*

SCIENCE

2017 scientific poster presentations (cont.)

**Dentistry, Scientific Category, 2nd place**

Brian Choi, Jae Chung, Reza Parhizkar, Anthony Pham, Rodrigo Robles

"Tensile strength of amalgam condensed under water"

Mentors: Clyde Roggenkamp, DDS, MSD, MPH; Udochukwu Oyoyo, MPH

**Dentistry, Scientific Category, 3rd place**

Tricia Aprecio, Allison Lee

"An in-vitro investigation of color stability of a soft denture liner"

Mentors: Montry Suprono, DDS, MSD; Udochukwu Oyoyo, MPH

**Dentistry, Scientific Category, 3rd place**

Arfassa Gullo, Minna Chun, Darlene Teddy, Emily Hwang, Christina Chi

"Tooth color change monitoring with different shade assessment tools: An in vitro study"

Mentors: So Ran Kwon, DDS, PhD, MS; Udochukwu Oyoyo, MPH

**Dental Hygiene, Clinical Category, 1st place**

Cammie Antell, Kiarra Gist, Uyen To, Bethany Shears

"Comparison of the efficacy of two infection control protocols in reducing bacterial contamination of operator computer keyboards"

Mentors: Marilyn Heyde, MPH; Patricia Plennan, BS (DH), MS; Ray Aprecio, OD; Udochukwu Oyoyo, MPH



Dental Hygiene, Clinical Category, 2nd place

Victoria Kha, Tricia Rodriguez, Alyssa Marcus, Alycia Lopez

"Effect of Xylitol & Arginine on Oral pH"

Mentors: Shirley Lee, BS (DH), MS; Udochukwu Oyoyo, MPH



Dental Hygiene, Clinical Category, 3rd place

Lemuel Fecue, Norma Juarez, Andi Chau

"The outcomes of a non-surgical periodontal treatment done by dental hygiene students"

Mentors: Darlene Armstrong, BS (DH), MA; Udochukwu Oyoyo, MPH



Dental Hygiene, Community Category, 1st place

Victoria Santiago, Melissa Cardenas, Estefany Hernandez, Anne Charles

"EBP knowledge, attitude, access and confidence of dental hygiene and dental students at LLUSD"

Mentors: So Ran Kwon, DDS, MS, PhD, MS; Udochukwu Oyoyo, MPH



Dental Hygiene, Community Category, 2nd place

Jess Bayer, Mackinsie Flores, Rachel Norman, Signe Anderson

"Clinicians perspective on oral and systemic effects of marijuana use"

Mentor: Shelly Withers, BS (DH), MS

SCIENCE

2017 California Dental Association/California Dental Hygiene Association scientific poster competition

LLUSD's Student Research Program was well represented May 5 at the student poster competition hosted each spring by the California Dental Association (CDA) and the California Dental Hygienists Association (CDHA) during their annual meetings in Anaheim.

Poster presentations are evaluated in three categories—scientific, clinical, and community—by judges that are volunteer dental professionals from CDA component dental societies throughout the state.

With eight dental student and five dental hygiene student groups from LLUSD participating, the diligent efforts of our students and mentors resulted in five awards and one honorary mention pictured on the adjacent page.

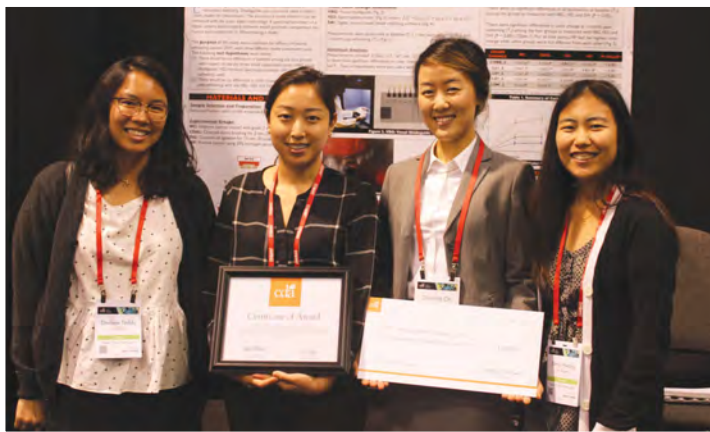
The poster competition provides a wonderful opportunity for LLUSD students to present their research and interact with students and oral healthcare professionals from other dental schools.



DDS Class of 2018 students with their program director (center back) So Ran Kwon, DDS, MS, PhD, MS, professor, Dental Education Services.



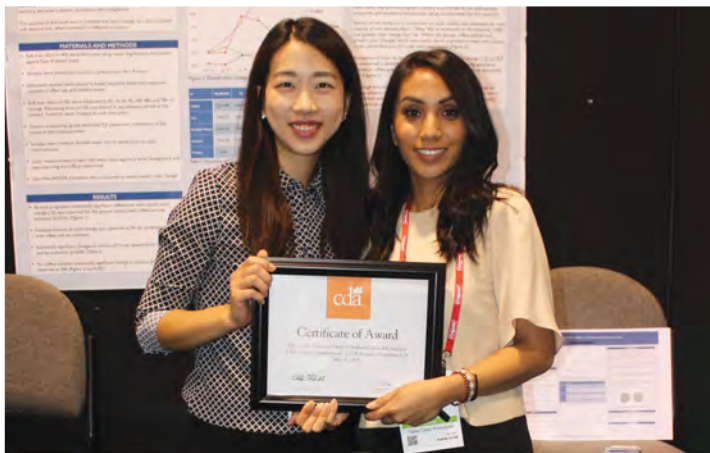
DH 2017 students with Dr. So Ran Kwon, DDS, MS, PhD, MS, front and center. Can you find the five Dental Hygiene faculty among them?



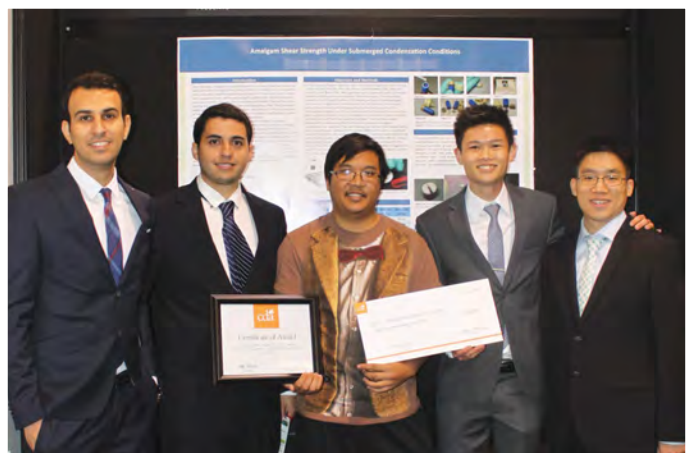
Dentistry Clinical Category 1st place
 Darlene Teddy, Minna Chun, Christina Chi Emily, Hwang, Arfassa Gullo (not shown)
"Tooth color change monitoring with different shade assessment tools: An in vitro study"
 Mentors: So Ran Kwon, DDS, MS, PhD, MS; Udochukwu Oyoyo, MPH



Dentistry Clinical Category 2nd place
 Sooyeon (Grace) Chung, Lidya (Lynda) Lee, Jamie Kim
"An In-vitro investigation of dimensional stability of an extended-pour irreversible hydrocolloid impression material over time"
 Mentors: Montry Suprono, DDS, MSD; Udochukwu Oyoyo, MPH



Dentistry Clinical Category Honorable Mention
 Allison Lee, Tricia Aprecio
"An in-vitro investigation of color stability of a soft denture liner"
 Mentors: Montry Suprono, DDS, MSD; Udochukwu Oyoyo, MPH



Dentistry Scientific Category 2nd place
 Reza Parhizkar, Rodrigo Robles, Anthony Pham, Brian Choi, Jae Chung
"Tensile strength of amalgam condensed under water"
 Mentors: Clyde Roggenkamp, DDS, MSD; Udochukwu Oyoyo, MPH



Dentistry Community Category 3rd place
 Abhishek Batra, Trina Chung
 Not pictured: Kayla Perez-Ortiz
"Perspectives of dental students and faculty on the value of performing a research project as part of the curriculum"
 Mentors: So Ran Kwon, DDS, MS, PhD, MS; Udochukwu Oyoyo, MPH



Dental Hygiene Original Research 1st place
 Victoria Santiago, Melissa Cardenas
 Not shown: Estefany Hernandez, Anne Charles
"EBP knowledge, attitude, access and confidence of dental hygiene and dental students at LLUSD"
 Mentors: So Ran Kwon, DDS, MS, PhD, MS; Udochukwu Oyoyo, MPH



Dental Unit Waterline Testing and Sterilization Assurance Service

Dental Unit Waterlines Testing Service (DUWLs) has been in operation since 2000. We evaluate microbial contamination of DUWLs and are actively involved in research on DUWLs biofilm removal and treatment methods. Over 800 dental offices, a number of universities, Veterans hospitals, medical/dental centers, and other agencies nationwide use this service for monitoring the quality of their DUWLs.

What are the advantages of using LLU School of Dentistry's DUWLs service?

- The Standard Method 9215 D (membrane filter method) of American Public Health Association (APHA) is used to examine microbial contamination in DUWLs.
- Multiple dilutions to detect heterotrophic plate count (HPC) bacteria counts up to 20,000 CFU/mL
- More than 18 years' experience
- Free consultations by experienced staff
- All-inclusive test kit containing sterile sample vials, ice packs, and detailed instructions in insulated test packages
- Test reports sent after the seven-day incubation
- Local customers may deliver samples directly to our research laboratory.

Sterilization Assurance Service (SAS) was established in 1998 and provides biological monitoring of sterilizers for over a thousand dental clinics, community colleges, and medical/dental centers and other institutions in more than 30 states.

What are some of the advantages of using LLU School of Dentistry's SAS?

- 20 years of experience
- Choice of Basic, BasicPlus, and Intensive spore testing services to help you meet infection control requirements within your budget
- Return envelopes or prepaid envelopes are included based on your choice.
- Option of weekly or monthly reports with available Certificate of Participation
- Failure notification by phone or e-mail on same business day
- Class V integrators for steam sterilizer is available to order. The combined use of spore test and STEAMPlus Integrators provide early detection by visually confirming the performance of your sterilizers.
- Online test results will be available soon.



Dental Unit Waterline Testing and Sterilization Assurance Service Order Form

Date _____

Dr. Name (Last) _____ (First) _____

Name office _____

Address _____ City _____ State _____ Zip _____

Phone () _____ Fax () _____ E-mail _____

Sterilization Assurance Service

Customer ID# (for current customers) _____

Sterilizer Type/Model/Serial #: _____

(Supplies for each sterilizer must be kept separate for identification purposes.)

☐ Steam _____ ☐ Chemical Vapor _____ ☐ Dry Heat _____

Basic (1) One test strip and one control strip per test (2) Return envelopes
(3) Monthly report (4) Failure notification via phone

Price	Quantity	Amount
\$89/12 tests	_____	\$ _____
\$119/24 tests	_____	\$ _____
\$169/52 tests	_____	\$ _____
Optional: Certificate of participation \$12/ea		\$ _____

Basic Plus (1) One test strip and one control strip per test (2) Return envelopes
(3) Weekly report (4) Failure notification via phone

Price	Quantity	Amount
\$229/52 tests	_____	\$ _____

Intensive (1) Two test strips and one control strip per test (2) Prepaid return envelopes
(3) Certificate of Participation (4) Report on each test
(5) Failure notification via phone

Price	Quantity	Amount
\$128/12 tests	_____	\$ _____
\$298/52 tests	_____	\$ _____

Class V Integrator for Steam Sterilizer (New)

Price	Quantity	Amount
\$32/100 tests	_____	\$ _____
\$220/1000 tests	_____	\$ _____

Dental Unit Waterline Testing

Customer ID# (for current customers) _____

Price / Kits	Amount
\$84/3 tests	\$ _____
\$144/6 tests	\$ _____
\$210/10 tests	\$ _____
\$420/20 tests	\$ _____

For more than 20 tests: \$21 _____ tests \$ _____


Optional: Certificate \$12/each \$ _____

- A foam box, ice packs, sample vials, and instructions included.
- Use APHA Standard Methods 9215 to test DUWLs samples.
- Full dilutions provide accurate Heterotrophic bacteria counts.

Shipping & handling

Priority Mail - starting \$15.00/box
FedEx 2-day - \$36/3-12 tests; \$45/13-40 tests

Check enclosed \$ _____ (made payable to SAS-LLU)

Charge: Total \$ _____ ☐  ☐ 

Name on card _____

Card number _____

Exp. Date ____/____/____ CCV# _____ Invoice# _____

Mail to:

Dental Waterline Testing & Sterilization Assurance Service
Chan Shun Pavilion, Suite A-1005
11175 Campus Street, Loma Linda, CA 92350

Tel: (909) 558-8176, (909) 558-8069

Fax: (909) 558-0307

E-mail: sas@llu.edu

<http://dentistry.llu.edu/research/faculty-research/projects/research-services>

LLUSD News

Erin Richards appointed chair for ADEA IPE SIG

Erin E. A. Richards, DDS'10, assistant professor, Division of General Dentistry; coordinator, Interprofessional Education; and associate director, Center for Interprofessional Education, Loma Linda University, has been appointed by the American Dental Education Association (ADEA) to chair its very first Interprofessional Education (IPE) Special Interest Group (SIG).

Dr. Richards was named to her leadership position during the recent ADEA annual meetings, March 17-21, 2017, at the Long Beach Convention Center, Long Beach, California. It was at last year's ADEA annual meetings that Dr. Richards and Margie Arnett led a small IPE group discussion and discovered there was no Special Interest Group for IPE. They soon discovered that the creation of a SIG requires an avalanche of paperwork that includes research evidence that IPE is useful and supporting signatures from many ADEA members. Even so, both agreed this special interest group must be created. Mrs. Arnett initiated the ADEA proposal and was awarded successful application to start the IPE SIG. Dr. Richards finished the task at the recent ADEA session where the new IPE SIG held its first meeting and first election.

The mandate of this IPE SIG is to focus

The mandate of this IPE SIG is to focus a collaboration of dental education stakeholders toward the creation and implementation of a robust IPE curriculum.

a collaboration of dental education stakeholders toward the creation and implementation of a robust IPE curriculum. The group's immediate goals include compiling assessment tools that apply across healthcare disciplines, an organized compilation of curricular successes and failures, and an online forum for sharing potential IPE possibilities.

Perhaps the most difficult and overarching challenge of the IPE SIG is to formulate pedagogical tools that will enable healthcare educators to prepare student clinicians for a cultural milieu that doesn't yet exist.

All of this, of course, is in the service of improving patient health, patient satisfaction with healthcare delivery, and a reduction in healthcare cost.

As the healthcare educational mandate evolves, the core competencies of inter-professional education have been identified

as essential modalities, exercises, practicums that will prepare LLUSD students for emerging requirements and responsibilities. As a consequence, with Dr. Richard's creative administration and advocacy, the School of Dentistry is poised to implement IPE in increasingly considered ways.



LLUSD ADEA attendees (L-R): Jessica Kim, DDS'05, assistant professor, DGD; Eun-Joo (Priscilla) Choi, DDS'96, assistant professor; Erin Richards, DDS'10, assistant professor; Holli Riter, DDS'98, MS, associate professor; Ron Forde, DDS'83, MSD, assistant professor; Soh Yeun (Eileen) Kim, DDS'10, assistant professor

Two LLUSD professors among 100 most-cited authors in implant dentistry

As primary authors of implant dentistry articles, Charles Goodacre, DDS'71, MSD, distinguished professor, Advanced Specialty Education Program in Prosthodontics, and Joseph Kan, DDS'90, MS'99, professor, Advanced Education Program in Implant Dentistry, each have two articles among the 100 most often cited.

Dr. Goodacre's publications, "Clinical complications with implants and implant prostheses," *J Prosthet Dent* 2003;90:121–132, and "Clinical complications of osseointegrated implants," *J Prosthet Dent* 1999;81:537–552, ranked numbers 50 and 57 with 278 and 256 citations respectively.

Dr. Kan's publications, "Immediate placement and provisionalization of maxillary anterior single implants: 1-year prospective study," *Int J Oral Maxillofac Implants* 2003;18:31–39, and "Dimensions of periimplant mucosa: An evaluation of maxillary anterior single implants in humans," *J Periodontol* 2003;74:557–562, ranked numbers 69 and 82 with 233 and 216 citations respectively.

With four article citations on the list, LLUSD was tied for third place—behind the University of Göteborg and the University of Bern—among institutions from which top 100 Implant Dentistry articles originated.

LLUSD was tied for third place—behind the University of Göteborg and the University of Bern—among institutions from which top 100 Implant Dentistry articles originated.

Of the top 100 identified, the majority were published between 1981 and 2009 in four major journals: *Clinical Oral Implants Research*, *International Journal of Oral & Maxillofacial Implants*, *Journal of Clinical Periodontology*, and *Journal of Periodontology*.

This bibliometric analysis of the top-cited articles pertaining to implant dentistry from articles published in "Dentistry, Oral Surgery, and Medicine" journals appeared in the third (2017) issue of *The International Journal of Oral & Maxillofacial Implants* (Volume 32) pp. 555-564 by Anastasia Fardi, DDS, PhD; Konstantinos Kodonas, DDS, PhD; Theodoros Lillis, DDS, MSc; and Alexander Veis, DDS, PhD.



Dr. Charles Goodacre



Dr. Joseph Kan

LLUSD News

Rodrigo Viecilli NIH scientific reviewer for OCDS

Rodrigo F. Viecilli, DDS, PhD, associate professor, Center for Dental Research and the Department of Orthodontics, has been appointed as a National Institutes of Health Scientific reviewer for the Oral Dental and Craniofacial Sciences (ODCS) study section that will meet in Arlington, Virginia, June 14-16, 2017. This study section reviews the majority of large grant applications related to dental research in the United States.

*Dr. Rodrigo Viecilli**Dr. Zhe Zhong**Zhe Zhong receives J. Morita Junior Investigator Award*

Zhe Zhong, DDS, PhD, assistant professor, Center for Dental Research, received the J. Morita Junior Investigator Award for Geriatric Oral Research at the 95th General Session & Exhibition of the International Association for Dental Research (IADR), March 22-25, at Moscone Center West, San Francisco, California, for her presentation entitled, "Responses of Mouse Mandible to Calcium Deficiency at Different Ages."

Tory Silvestrin's trifecta

Tory Silvestrin, DDS, MSD'15, MSHPE, associate professor, Department of Endodontics, completed the end of the 2017 academic year with three substantial professional advancements. He was awarded Diplomate status by the American Board of Endodontics; at the recommendation of the LLUSD promotions committee he was awarded the status of associate professor; and he accepted the position of interim chair, Department of Endodontics.

*Dr. Tory Silvestrin*

So Ran Kwon receives SCAD VITA Award and Colgate-Palmolive grant

So Ran Kwon, DDS, MS, PhD, MS, associate professor, Dental Education Services, received the VITA Award for excellence in research related to color and appearance in esthetic dentistry by the Society for Color and Appearance in Dentistry (SCAD) at its annual meeting held September 28-29, 2012, in Chicago.

The Society for Color and Appearance in Dentistry (SCAD) was founded in 2008 as a consortium of dental professionals and other experts interested in this area of aesthetic dentistry specifically related to scientific investigation and application of color and appearance in dentistry.

Funding approved by Colgate-Palmolive

A proposal by Dr. Kwon for a grant to study the mechanism of tooth stain penetration was approved in February 2017 for funding under Colgate-Palmolive's current Colgate Award for Research Excellence (CARE) program.

There are two distinct approaches in the oral healthcare industry for treating discolored teeth: for surface (or extrinsic) stains, mechanical approaches using tooth brushing and toothpaste; for subsurface (or intrinsic) stains, chemical processes that utilize peroxide performed either under the supervision of the oral healthcare professional or privately by consumers.

Because the full dynamics of penetration and intercalation of the stain molecule within the tooth structure remains unknown, Dr. Kwon's research will utilize re-structured gold nanorods to reveal the dynamics of stain internalization and thereby facilitate the development of novel compounds to improve outcomes for the treatment of tooth discoloration.

"We received a large number of applications in this inaugural cycle of the [CARE] program," said Jorge E. Rojas, DDS, academic manager Western Region for Colgate Oral Pharmaceuticals. "We realize that your efforts have been significant and might have an impact on oral health, as confirmed by the selection of your proposal by our external panel of evaluators."

Yiming Li, DDS, PhD, MSD, director, Center for Dental Research and associate dean for Research, will mentor the project, and Dr. Kwon, as principal investigator, will collaborate with Chris Perry, PhD, assistant professor, Division of Biochemistry, School of Medicine.



Dr. So Ran Kwon

LLUSD offers Orthodontic Assisting Permit Program

This 84-hour course (52 hours at LLU laboratory, 32 hours at extramural facility) **makes RDA students eligible to take the written state board examination for Orthodontic Assisting Permit licensure.**

This Orthodontic Assisting Permit course will train you to

- prepare teeth for bonding, and select, pre-position, and cure orthodontic brackets after their position has been approved by a licensed dentist;
- remove only orthodontic brackets and attachments with removal of the bonding material by a supervising licensed dentist;
- size, fit, and cement orthodontic bands;
- remove orthodontic bands and excess cement from supragingival surfaces of teeth with a hand instrument;
- place and ligate archwires.

Tuition: **\$1,500**

To register, contact Jeri at: **JLFowler@llu.edu**

For details call: **(909) 558-4399**

LLUSD News

Center for Dental Research acquires high-resolution 3D micro imaging device

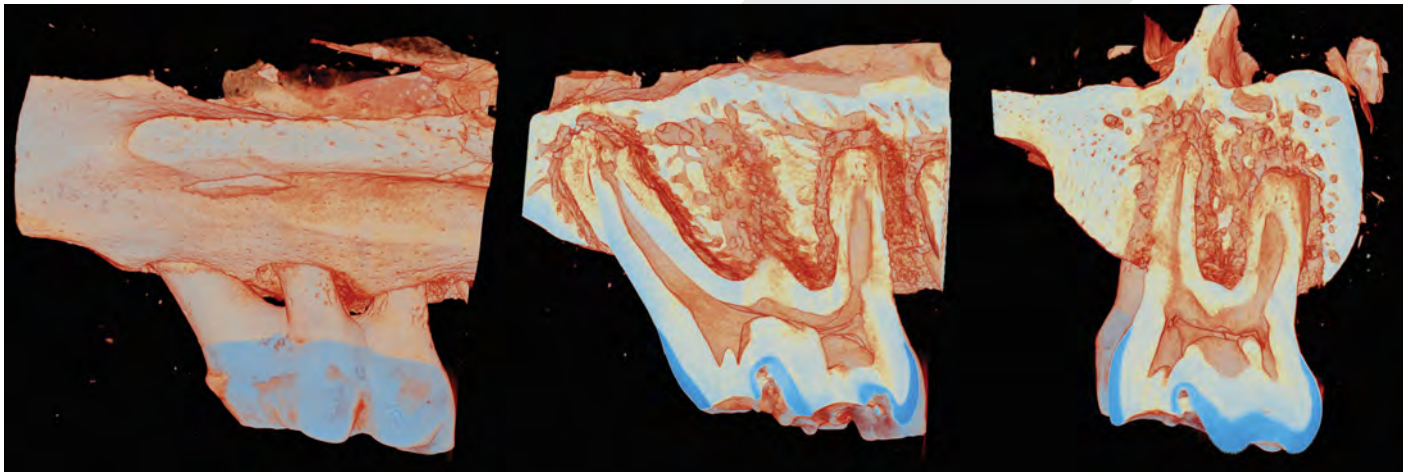
The Center for Dental Research (CDR) has recently added a new Micro-Imaging Research Facility which has acquired a Bruker SkyScan 1272 Micro-CT scanner (operational since May). This state-of-the-art instrument provides 3-dimensional, non-destructive X-ray imaging of a scanning subject's internal microstructure. The Center's services are available to all LLU researchers as well as scientists in other academic institutions and private industry.

According to Yiming Li, DDS, PhD, CDR director and associate dean for Research, the \$350,000 scanner acquisition was made possible by a combination of personal donations, contributions from the Department of Orthodontics and Dentofacial Orthopedics, and the CDR budget.

The innovative flexible acquisition geometry of the SkyScan 1272 device has significant advantages over intermediate resolution level machines. Its scans—up to 200 Megapixels—are several times faster (to obtain the same or better image quality) than those of micro-CT systems with a fixed source-detector design.

Capable of scanning subjects as large as 75mm in diameter, the system can automatically optimize X-ray energy and energy filtering using a new maintenance-free X-ray source and automatic 6-position filter changer. And more than 2600 such slices can be reconstructed in 3D after a single scan. (See examples below.) The state-of-the-art scanner (adjacent page) is particularly useful for imaging and analyzing bone and dental tissue, soft tissue samples (with the aid of contrast agents), and dental materials. Designed for multi-users, CDR's Micro-Imaging Facility provides services to LLU faculty, staff, and students as well as to external users by way of an online system and assuming IRB or IACUC approval if applicable.

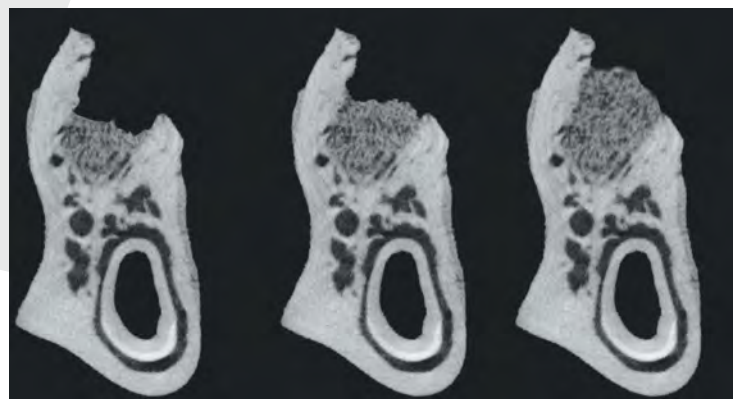
Utilization is supervised by Rodrigo Vieceilli, DDS, PhD, associate professor and director of Micro-Imaging and Biomechanics Research Laboratory, along with the assistance of Gina Roque-Torres, DDS, MsC, PhD, postdoctoral fellow and research associate, Center for Dental Research.



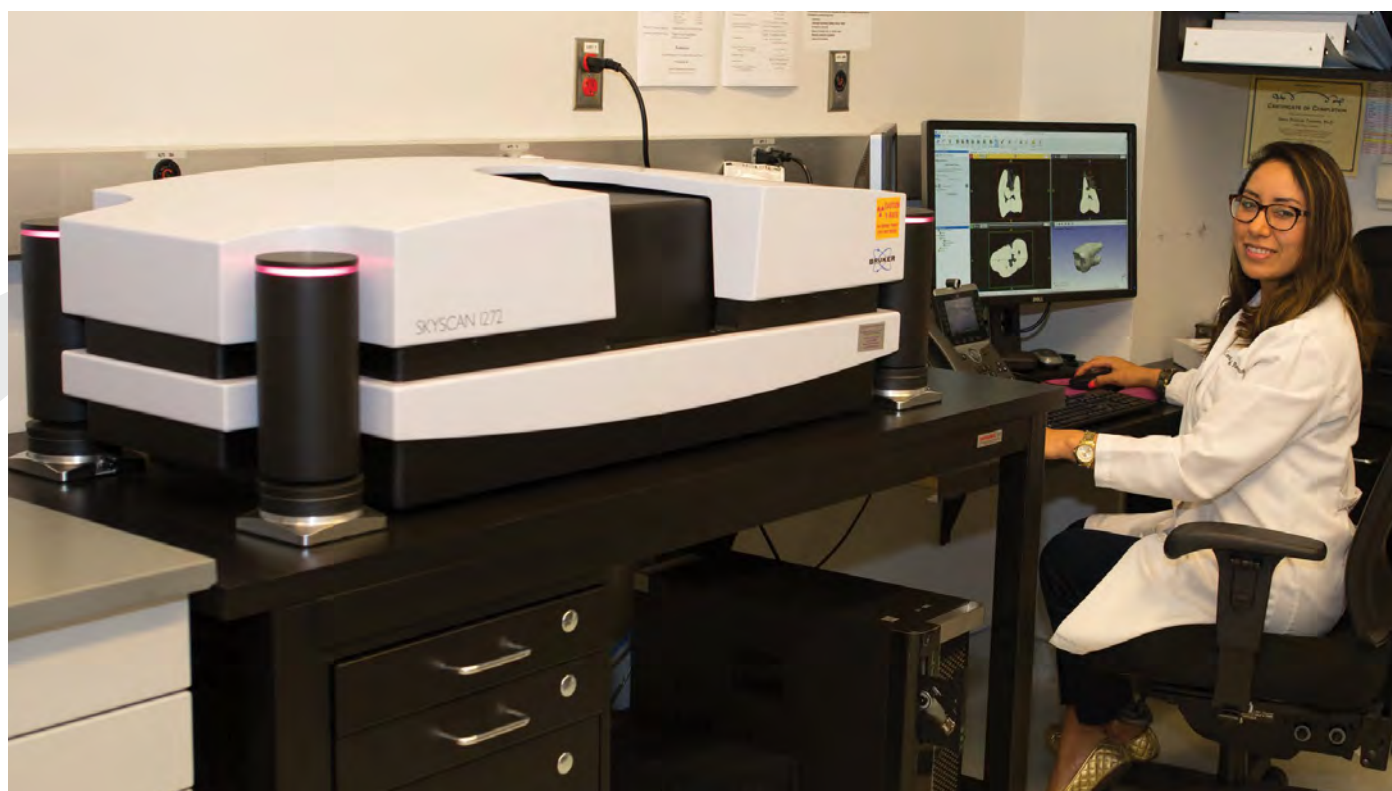
Root resorption in maxillary first molar after orthodontic force application in a mouse



Tooth and root canal



Alveolar bone repair in irradiated rat



Dr. Gina Roque-Torres operates the SkyScan 1272 scanner.

LLUSD researchers present at IADR 2017

LLU School of Dentistry researchers and presenters were well represented at the 95th General Session and Exhibition of the International Association of Dental Research held in San Francisco, California, March 22 – 25, 2017.

There were 14 presenters from Loma Linda University. Twelve of them were from the School of Dentistry of which six were representatives of the Center for Dental Research. Two LLUSD participants made oral presentations: Jung Wei Chen, DDS, MS, MS, PhD, program director, Advanced Specialty Education Program in Pediatric Dentistry, and So Ran Kwon, DDS, MS, PhD, MS, professor, Dental Education Services, and director, Student Research.



*Dr. Kwon and Wu Zhang, MD, professor,
Dental Education Services*

LLUSD News

Heidi Kohltfarber receives PhD

Heidi Kohltfarber, DDS'03, MS, PhD, associate professor, Department of Radiologic and Imaging Sciences, was awarded a PhD degree in Diagnostic Imaging with an emphasis in Craniofacial Radiology by King's College London on June 1, 2017, during a ceremony at Southwark Cathedral.

Dr. Kohltfarber's dissertation was entitled "Validation and Diagnostic Efficacy of 3D Surface Models in Dentistry: Temporomandibular Joints." She successfully defended her dissertation with no revisions/edits required—a defense that was deferred from a scheduled February 15 date at the discretion of her third baby girl who arrived early on February 12, 2017.



Dr. Heidi Kohltfarber

Dr. István Urbán book published

Dr. István Urbán

István Urbán, DMD, MD, adjunct assistant professor, Advanced Education Program in Implant Dentistry, is author of the recently published textbook, *Vertical and Horizontal Ridge Augmentation: New Perspectives* (New Maiden: Quintessence Publishing, UK, February 2017), 400 pages including 1,229 illustrations.

The publisher describes Dr. Urban's book as "a frank, ambitious, and immensely informative text on the clinical practice of ridge augmentation with GBR."

Pediatric Dentistry announcements

Jung-Wei Chen, DDS, MS, PhD, MS, program director, Advanced Specialty Education Program for Pediatric Dentistry, was elected secretary of the Dental Research Pediatric Oral Health Research Group for 2017-2018 at the annual General Session & Exhibition of the International Association for Dental Research in San Francisco, CA, March 22-25, 2017.

Program Enrichment Grant

In April the Department of Pediatric Dentistry was awarded a \$4,000 Program Enrichment Grant from the California Society of Pediatric Dentistry Foundation (CSPD). The CSPD grant will be used to help support part-time and volunteer faculty with seminar lunches, meals for staff meetings, and parking passes.



Dr. Jung-Wei Chen

2017 Children's Day Fair surmounts drizzle

Despite a morning drizzle, the 32nd annual LLUH Children's Day Fair was a rousing success, with 1,665 children from around the Inland Empire enjoying entertainingly presented health education.

Hosted at a variety of educational stations on the University quadrangle, rudimentary oral healthcare instruction was provided to young learners at the School of Dentistry's three-table station and in the School's two-chair mobile clinic—all served by 50 LLUSD students, faculty, and staff along with five volunteer dentists and one dental assistant from the Jerry L. Pettis Memorial Veteran's Medical Center (see below).

Particularly engaging was the sight of youngsters bringing their favorite stuffed animals on which they practiced tooth brushing under professional scrutiny. Children also used cardboard x-ray machines to image the mouths of their animals and sometimes friends or siblings. Their participation was rewarded with oral hygiene freebies that included toothbrushes, toothpaste and a coloring book.

Practicing on their stuffed animals, or those provided at the fair, children become acclimated to basic procedures they may encounter when they visit the dentist and thereby limit anxiety over the unexpected even as they learn the importance of personal oral healthcare.

This 32nd annual Children's Day Fair attracted more media attention than usual—a two minute-segment ran on KABC TV *Eyewitness News*: <http://tinyurl.com/y825ko9r>

ABC7 Health Specialist Denise Dador interviewed Dorothy Brooks, LLU Children's Hospital child life and bereavement specialist, who coordinates the annual event. Brooks told Dador that the Children's Day Fair helps youngsters "understand that when they come to the hospital it's a place for helping them." The event is "all about learning how to live healthy and save lives," she added.

A write-up appeared in the *Redlands Daily Facts*: <http://tinyurl.com/y85u2oce>

Jeri Fowler, RDAEF2, OA, assistant director, Alumni Affairs, organized and staffed the School of Dentistry's oral healthcare station.



Susan Xu, DDS, 1st-year pediatric dentistry resident, monitors a couple of possible future dentists.

2017 Children's Day Fair School of Dentistry volunteers

Jerry L. Pettis Memorial VA Medical Center

Justin Verdin, DDS
Nhu Nguyen, DMD
Brett Bergseid, DDS
Mainer Danira Flores, DDS'16
Natasha Petrie, DDS
Stella Suba, RDA, CDA

LLUSD Service Learning

Gary Kerstetter, DDS'82, director, Service Learning
Kenny Dalen-Gyckiewicz, D4
Allen Kim, D4

Eric Johnston, D4
Fabiola Giron, D4
Isaac Chong, D4
Osman Cruz, D4

Advanced Education in Pediatric Dentistry

Bonnie Nelson, DDS'88, chair, Department of Pediatric Dentistry
Eduardo Rappaccioli, DMD
Lin Jing, DMD
Roya Mahmoodi, DDS
Susan Xu, DDS

Department of Dental Hygiene

Darlene Cheek, BS'71 (DH), MPH, associate professor
36 dental hygiene seniors

Continuing Dental Education

Alfred Batiller, student IV
Jeri Fowler, RDAEF, OA, assistant director, Alumni Affairs

FOND FAREWELLS

Wilbur Bishop**Dr. Wilbur Bishop**

Born in Aberdeen, Mississippi, January 10, 1929, Wilbur Bishop Jr., '59, served four years in the U.S. Air Force during the Korean conflict. After predoctoral studies at Southern Missionary College, Collegedale, Tennessee (now Southern Adventist University), he completed dentistry at LLUSD in 1959. Practicing initially in California, he then pursued a practice first in Summerville, Georgia (1974), and later (1987) in Calhoun, Georgia, until his retirement in 1998.

Active in his local church, Dr. Bishop participated in Maranatha Volunteers International, which took him and his wife to sites in Chili, Zambia, Dominican Republic, Ecuador, Paraguay, and Panama.

Dr. Bishop's wife of almost 57 years, Pattie, preceded him in death. He died at his residence in Fairmount, Georgia, on June 15, 2017. His survivors include his son David (wife Carla) of Fairmount, Georgia; his daughter Beth (husband Doug) Barrow of McDonald, Tennessee; and four grandchildren, who shared many happy hours with him.

Donations to Maranatha Volunteers International in Dr. Bishop's memory will be appreciated

Rustom Dastur**Dr. Rustom Dastur**

At home on February 12, 2016, Rustom P. Dastur, DDS '68, died peacefully in Point Loma, California. Born in Mumbai, India, in 1934, he had attended Wilson College and Sir C.E.M. Dental College, both in Mumbai, before entering the Indian Army. Ranked as a major, he served as paratrooper and dentist in the United Nations Organization in the Belgian Congo and at the Pakistan borders.

Upon completing requirements for dental practice in the United States with LLUSD's class of '68, Dr. Dastur practiced in Point Loma with his wife of 43 years, the late Soona B. Jahina, DDS '68. After retirement he pursued

his interest in law, attending Thomas Jefferson School of Law in San Diego, California. He was sworn into the California State Bar at the age of 64.

Dr. Dastur will be remembered for his humor, generosity, and ability to engage in conversation with anyone he met. The family has suggested that donations in Dr. Dastur's memory be made to Operation Smile (<http://www.operationssmile.org/act-now/donate-surgeries>).

Paul Conner**Dr. Paul Conner**

Paul Conner, DDS '71, of Shiocton, Wisconsin, died unexpectedly at home on May 12, 2017. Born on July 24, 1946, in Saginaw, Michigan, he spent his early years in Peru and Brazil with missionary parents. After studying at Pacific Union College and Haile Selassie University in Addis Ababa, Ethiopia, he joined LLUSD's class of '71. Upon graduation, he established a dental practice in Appleton, Wisconsin, and served the community there for more than 45 years.

An avid runner, bicyclist, and golfer, Dr. Conner installed a gym for workouts in his office basement. Notably committed to community and church projects, he sponsored education for youth, and with a core group of people he participated in Maranatha Volunteers International, overseeing the building of many churches and schools in disadvantaged countries. During the construction time he and other dentists and physicians conducted medical and dental clinics for the locals, most of whom had no access to such services.

Dr. Conner is survived by his mother, Muriel Conner, 95, of Appleton; Ethel of Shiocton, his devoted wife of 48 years; his children—Misty (Jody) Wood of Lonsdale, Minnesota, and Nicholas (Heather) Conner of Novi, Michigan—and seven grandchildren.

Memorial donations may be made to Maranatha Volunteers International.

Susan Cartwright Feller**Dr. Susan Cartwright Feller**

Susan Cartwright Feller, DDS '58, said recently, "I was a warrior. I fought the good fight, but in the end I've lost." She died May 1, 2017, after a decade of battling cancer.

Born in Mount Clemmons, Michigan, on July 15, 1958, Dr. Feller worked as a teenager in a dental office and later served as a dental assistant before becoming a dental hygienist and in turn completing dentistry at the University of Detroit. When she moved to California, she had an appointment at the Veterans Medical Center before joining the LLUSD dental

faculty as assistant professor in the Clinical Research Center. She worked there, testing restorative materials and dental and hygiene products from April 1996 to June 2005, when she was diagnosed.

An avid skier and golfer, Dr. Feller also traveled extensively with her husband, throughout North America and visited most countries of Europe as well as China, Hong Kong, Australia and New Zealand. She is survived by her husband, Ralph Feller, DMD, his three children and six grandchildren.

The Susan Cartwright Feller DDS Memorial Scholarship Fund for students pursuing dental hygiene or dentistry has been established in her memory. Contributions may be made to the Rotary Club of Redlands Foundation.

FOND FAREWELLS

Leslie Gillis

Surrounded by family in Paso Robles, California, Leslie Gilliss, DDS'78, died peacefully on November 16, 2016. Born February 4, 1953, in Baltimore, Maryland, Dr. Gilliss graduated cum laude in 1975 at University of Maryland, before entering LLUSD's class of '78. He practiced dentistry for more than 30 years, most recently in Morro Bay, California.

Remembered for his good humor and quick wit, Dr. Gilliss was a vigorous hiker, camper, gardener, and traveler. Accomplished on the piano and organ, he also had a natural ability and perfectionist's drive to "fix anything." A deep Christian faith sustained him during his final battle with cancer, which ended on November 16, 2016, in Paso Robles, California.

Mourning their loss are Dr. Gilliss' wife of 40 years, Jean of Paso Robles; his son Matthew (wife Valerie) of Paso Robles; his daughter Janessa (husband Craig) Filipponi of Paso Robles; three granddaughters, and a grandson who arrived April 2017.

The family suggests that memorial remembrances go to the Leukemia and Lymphoma Society in Dr. Gilliss' name.



Dr. Leslie Gillis

Howard Kim

Howard Kim, DDS'67, who lived most of his life in Hawaii, was born in Waiialua, O'ahu, on September 5, 1940, and attended Hawaiian Mission Academy. Completing predoctoral studies at Walla Walla College (now Walla Walla University) in Washington, he entered LLUSD's class of '67. Upon graduation he served in the U.S. Air Force before opening his dental practice (1975) in Kailua, Hawaii. He would remain active in that practice until his death on May 10, 2017.

His daughter and son-in-law joined his pediatric practice after completing dentistry at LLUSD. At home Dr. Kim was a conservationist, preserving redwood, for example, in a renovation project; and he was famous in his circle of friends for the tropical fruits he picked and gave to them.

Dr. Kim's survivors include his wife of 48 years, Audrey Chang Kim, LLUSD '66, of Kailua; son David (wife Deann) of O'ahu; daughters Julie of Loma Linda and Maile, DDS'04 (husband Bren Chun, DDS'08), of Kailua; and two grandsons.

Condolences may be sent to the Kim family at 2551 Sonoma Place, Honolulu, HI 96822-1912.

The family requests that random acts of kindness be performed in Dr. Kim's memory.



Dr. Howard Kim

Ben Register

John "Ben" Bendel Register, born December 5, 1927, in rural Louisiana, grew up learning both the necessity and value of hard work, a trait he carried with him all his life.

Dr. Register served in the army before entering LLUSD's class of '59. He would practice dentistry in Massachusetts for over 30 years, until retiring ten years ago on Cape Cod. He frequently interrupted his dental practice to treat underserved patients in Honduras.

A life-long learner, Dr. Register was a regular at the Mashpee Public Library, enthusiastically exploring the worlds of poetry, music, art, and movies.

Predeceased by his brother, Dr. U.D. Register (a long time LLU faculty member), Dr. Ben Register died on February 4, 2017, in Sandwich, Massachusetts. His survivors include his first wife Barbara and their four children—Robert Bruce, Linda Suzanne Merrill, John Brian (wife Susan), and Guri Louise (husband Glenn) Davis—his eight grandchildren, and his nine great grandchildren.

The family has suggested that memorial gifts may be made to the Mashpee Public Library in Mashpee, Massachusetts.



Dr. Ben Register

David Samaniego

Born in El Paso, Texas (February 2, 1962), David Samaniego, DDS'96, grew up in Indio, California, and pursued predoctoral studies at La Sierra University, Riverside, California. While completing dentistry with the class of '96, he volunteered repeatedly with Doctors Without Borders and Adventist Development and Relief Agency on mission trips to Baja California and Chiapas, Mexico, as well as going to the Amazon jungles of Brazil on a three-month mission trip.

Upon graduation from LLUSD, Dr. Samaniego joined the practice of his brother, Mario Samaniego, DDS'81, in Las Cruces, New Mexico, where he practiced for 21 years. He was energized by times spent on his tractor in his pecan orchard. But he retained a passion for dentistry and for his patients, who treasured his skills. He conducted a 5 ½- year battle with cancer, until his death on June 11, 2017. He was 55 years old.

Among his mourners are Dr. Samaniego's wife, Patty; his son, Abraham David; his daughter, Nadia Cristina—all from Las Cruces—and his mother, four sisters, and four brothers.



Dr. David Samaniego

FOND FAREWELLS

Soona B. Jahina***Dr. Soona Jahina***

Humanitarian and orthodontist of San Diego, Soona B. Jahina, DDS'68, died April 23, 2009. She had completed dentistry (Bombay University, India) and a master's degree in orthodontics (University of Pennsylvania) before graduating at LLUSD with the class of '68.

A professor at the University of Southern California School of Dentistry and UCSD School of Medicine, she shared her knowledge with teams at Children's Hospital and San Diego U.S. Naval Medical Center as a member of the craniofacial deformities department. Her

humanitarian efforts took her to China, Africa, India, and Mexico as part of the cleft lip and palate mission teams.

Dr. Jahina received honors from the American Association of Orthodontists, American Dental Association, the Academy of Dentistry International and held fellowships in the American and International College of Dentists as well as other organizations during 40 years of humanitarian service. In 1983 she became one of the founders of the "Thousand Smiles Foundation, Field Mission Team" in Ensenada, Mexico.

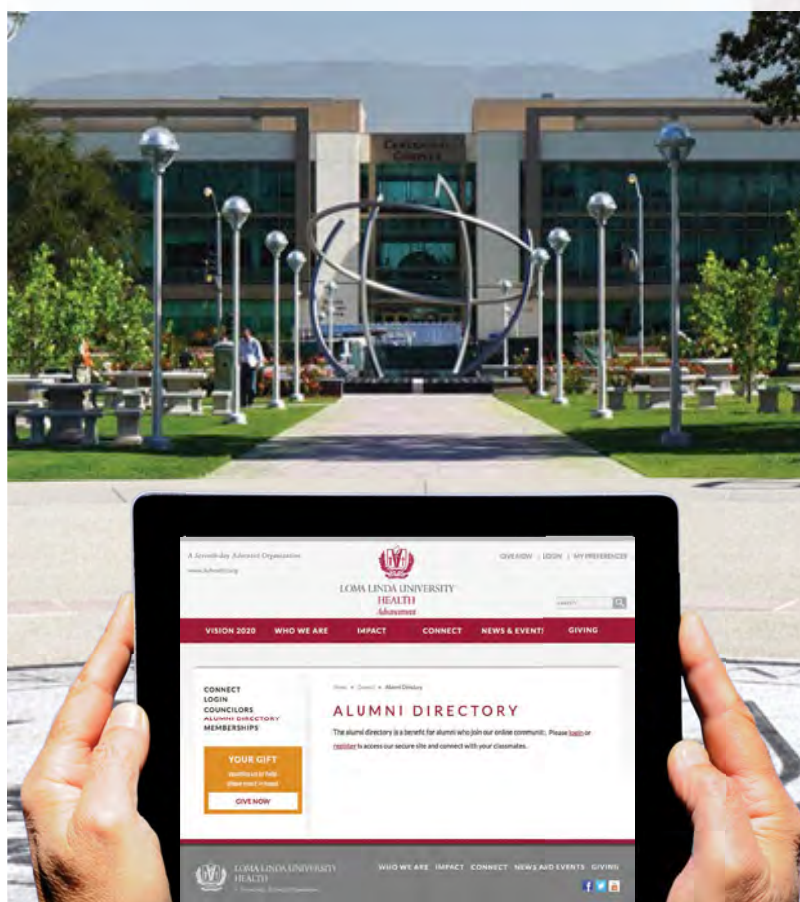
Dr. Jahina predeceased her husband, Rustan P. Dastur, DDS'68, who died in 2016. Her survivors include two brothers, three sisters, six nephews, and three nieces.

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